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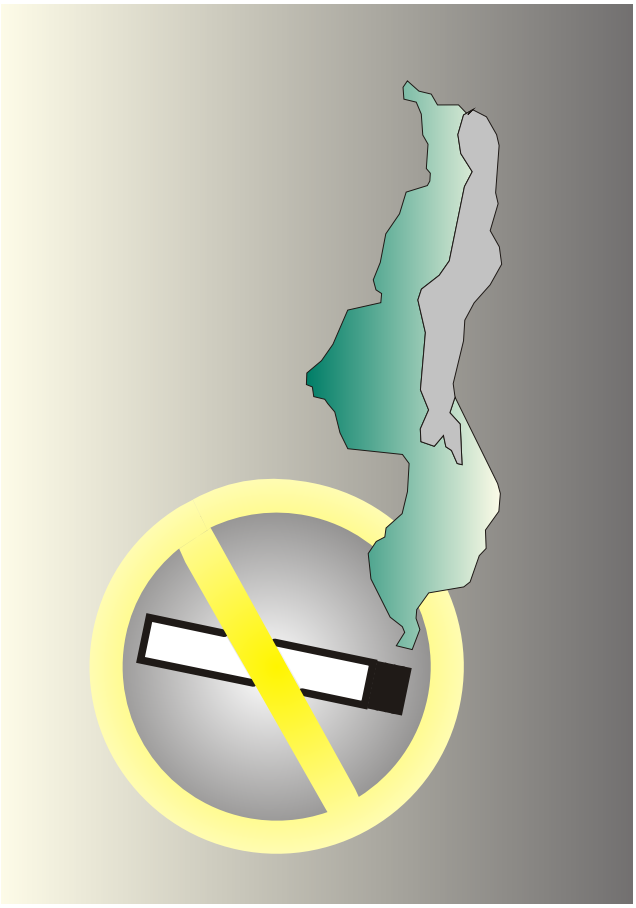

UNITED NATIONS CONFERENCE ON TRADE AND DEVELOPMENT
Geneva

ECONOMIC ASPECTS OF DEVELOPMENT OF AGRICULTURAL ALTERNATIVES TO TOBACCO PRODUCTION AND EXPORT MARKETING IN MALAWI

by

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PREFACE

This study was prepared by Dr. Charles S. Mataya and Mr. Ernest W. Tsonga, consultants for UNCTAD/UNDP project MLW/98/008/08, entitled, "Economic aspects of development of agricultural alternatives to tobacco production and export marketing in Malawi". Their terms of reference are included as an annex to this report.

The project was carried out in furtherance of resolution 1993/79, entitled "Multisectoral collaboration on tobacco or health", of the Economic and Social Council of the United Nations (ECOSOC). Besides expressing concern about the serious health consequences of tobacco use, the resolution also expressed concern about the possible economic effects of reduced tobacco production in the tobacco-producing countries, which are still unable to develop viable economic alternatives to tobacco production. Paragraph 7 of the resolution called for assistance with development of agricultural alternatives to tobacco as follows:

> *"Invites Member States and organizations of the United Nations system to develop a range of options, including bilateral and effective multilateral collaboration on agricultural diversification or development of other economic alternatives to tobacco agriculture, as appropriate, to assist economies for which tobacco is a major export, where demand for their tobacco products has decreased as a result of successful strategies for tobacco control."*

Subsequently, ECOSOC resolution 1994/47 reiterated the need to address all the issues raised in resolution 1993/79, with national plans of action to be developed, upon request, taking into account the economic and social aspects of tobacco production and consumption and the serious health consequences of tobacco use.

The project was requested by the Government of Malawi and was implemented by the UNCTAD secretariat with financial and administrative support of UNDP/Malawi.

Chapter I of the report was prepared for the First Expert Workshop under the project, which was held on 11 March 1999 to review the consultants' assessments of previous research and make plans for carrying out their study. After the consultants completed the study, the Second Expert Workshop, held on 21 and 22 July 1999, considered its findings on diversifying beyond tobacco, identification of limiting factors and proposals for future policy, strategies and institutional options. The Second Expert Workshop adopted the recommendations in chapter III on diversification out of tobacco production and export marketing in Malawi.

UNCTAD Secretariat
May 2001

Acknowledgements

The project, which formed the basis of this study, was coordinated by David Elliott of the UNCTAD secretariat and was part of the work programme of the UN Focal Point on Tobacco or Health, Raul Uranga. David Elliott and Ulrich Hoffmann edited the study and prepared it for publication. Petra Hoffmann desktop-published the manuscript.

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ACRONYMS

ACP	African, Caribbean and Pacific
ADMARC	Agricultural Development and Marketing Corporation
ARET	Agricultural Research and Extension Trust
CADECOM	Catholic Development Commission of Malawi
COMESA	Common Market for East and Southern Africa
CONGOMA	Council for Non-Governmental Organisation in Malawi
CODEX	Commodity Description Coding System
DRC	Domestic Resource Cost Ratio
EU	European Union
ECU	European Currency Unit
ESCOM	Electricity Company of Malawi
FAO	Food and Agriculture Organization
ISO	International Organization for Standardization
ITC	International Trade Centre (UNCTAD/WTO)
MEPC	Malawi Export Promotion Council
MCI	Ministry of Commerce and Industry
MCCI	Malawi Chamber of Commerce and Industry
MIPA	Malawi Investment Promotional Agency
MoAI	Ministry of Agriculture and Irrigation
MoF	Ministry of Finance
MOPAM	Multiple Objective Policy Analysis Matrix
NASFAM	National Association of Small Farmers
NDDF	Northern Division Dark-Fired Tobacco
NEC	National Economic Council
NGO	Non-governmental Organization
OPV	Open Pollinated Varieties
PAM	Policy Analysis Matrix
SADC	Southern Africa Development Community
SGS	Société Générale de Surveillance, S.A
SHOGA	Shire Highlands Organic Growers Association
STABEX	Export Income Stabilisation Scheme
UNDP	United Nations Development Program
USAID	United States Agency for International Development
WHO	World Health Organization
WTO	World Trade Organization

EXECUTIVE SUMMARY

The report assesses a number of potential agricultural alternatives to production and export marketing of tobacco from Malawi. It provides analysis and findings on current profitability of alternatives as well as potentials for employment and export earnings, as compared with tobacco. The social needs of employing a large number of workers currently engaged in tobacco production and the country's need for export earnings are thus taken into account.

The report is intended to contribute to the long-term process of diversification and clarify options. It includes recommendations made by an Expert Workshop held in Blantyre, Malawi (21-22 July 1999) addressed to the private and public sectors on further action on production and export marketing of new agricultural products that have high developmental and export potentials.

Following a review and synthesis of literature on the development of agricultural alternatives to tobacco production and exports in Malawi, further analysis was undertaken on production and export marketing of alternative products for the country.

Gross margin analysis and Domestic Resource Cost ratios (DRC) were used as methods to identify potential alternative commodities to tobacco. Although previous studies spanned different time periods and differed on scope of commodity coverage, their conclusions were similar. In particular, Malawi should diversify out of tobacco and concentrate on commodities, which are of high value, but less bulky, such as spices, oil seeds, some horticultural crops, cotton, pulses and mushrooms. Although there was convergence of findings to previous studies, changes that occurred later in the terms of trade following market liberalization altered the comparative advantage and priority among them.

The use of gross margins and DRC ratios ignores multiple objectives associated with the choice of enterprises or enterprise combinations for farmers to engage. The Multiple Objective Policy Analysis Matrix (MOPAM) method was used to overcome this weakness. Factors considered in the MOPAM analysis were: drought tolerance, price variability, income generation, food security, employment and diversification potential. MOPAM used weighted scores to select commodities for diversification. Each factor was assigned a weight, depending on the importance of that factor for the commodity under consideration, and given a score. A second set of MOPAM criteria were: drought tolerance, competitiveness (DRC), income generation, food security, employment, environment, production and technology. In addition, benefit/cost indicators were computed to complement efficiency criteria for commodity selection. The benefit/cost indicator is a ratio between discounted benefits and costs for a commodity.

Analysis was carried out on 36 commodities using 1999 price and production statistics. The need to focus on a limited range of potential commodities for diversification prompted consideration of only 10 commodities including beans, groundnuts, pigeon peas, soyabeans, millet/sorghum, cotton, rice and cassava. Although maize is an important food crop for the domestic market, it was not

included as it has already received much attention in terms of research and development programs compared with other commodities.

The five methods for identifying potential enterprises for diversification provided different rankings in terms of priority. This was expected due to differences in emphasis and choice of commodities as well as differences in factors used in the two sets of MOPAM indicators. While the DRC ranking emphasized export competitiveness among enterprises, the benefit/cost approach highlighted enterprise feasibility with respect to discounted return to investment, given cost of capital as measured by commercial lending rates. The gross margin approach is a crude measure of profitability, given that it does not take into account fixed cost and depreciation of capital items. The MOPAM procedures attempted to amalgamate a wide array of socio-economic considerations and constraints including environment. Two sets of MOPAM indicators were estimated. Differences between the two sets mainly arose from the choice of commodities, and the composition of stakeholders involved in determining weights and scores of factors for the commodities.

The findings for each method are as follows:

- According to the magnitude of the DRC, Malawi had comparative advantage in all commodities considered for export (using export parity prices) except poultry (broilers and layers). Coffee followed by sorghum, paprika, inter-planted beans and maize, pure stand beans, soybeans, Irish potatoes, pigeon peas/maize and rice appear to have significant competitiveness in terms of export value.
- When benefit/cost ratio was used as an indicator of diversification potential, the order of ranking did not significantly change the profile of commodities, except sorghum and macadamia nuts which are placed highest and lowest, respectively. Long gestation period for macadamia trees probably accounted for the shift in the placement.
- When gross margin was used as a criterion for diversification potential, estate flue-cured tobacco was placed highest in the commodity set, followed by estate coffee, green pepper, cabbage, Northern Division Dark Fired Tobacco (NDDF), estate and smallholder burley tobacco and paprika.
- The MOPAM indicators were weighted by the importance of price variability, income generation, food security, employment, potential for diversification and drought tolerance. They showed macadamia nuts ranked highest among all commodities, followed by estate coffee, cassava, Irish potatoes, estate tobacco (flue-cured), smallholder coffee, paprika and NDDF.
- The second set of MOPAM criteria were: drought tolerance, competitiveness (DRC), income generation, food security, employment, environment, production and technology. This set of MOPAM rankings placed cassava highest in priority, followed by beans, groundnuts, pigeon peas, soyabeans, millet/sorghum, cotton and rice.

An important factor is that geographical suitability and inadequate technology would limit the extent to which the majority of the rural masses would benefit from coffee and macadamia nut production. In addition, some of these commodities, such as cassava and horticultural crops, are bulky and highly perishable requiring improved methods of processing and storage to enhance value-added. Thus, their potential as alternatives to tobacco will largely depend on technology

development geared toward value-adding. Although horticultural commodities score highly on the gross margin criterion, they perform poorly on efficiency (DRC and benefit/cost) and MOPAM largely because of poor management under smallholder regimes. There is room, however, to increase returns to investment in horticultural products by improving management practices such as selection of varieties, adoption of improved husbandry practices, handling, grading, packaging and presentation. All these require producers to be market-oriented in their planning and decision-making process.

The report reviews the marketing prospects for alternatives to tobacco and constraints to diversification. It analyzes constraints and needs in marketing systems and channels as well as environmental considerations and the trade context in national, regional and global markets for products that are potential alternatives to tobacco.

The overall conclusion from the production analysis is that, if resources were available to support the development of only seven major commodities from production, processing, to domestic and international marketing, these would be:

- cassava
- groundnuts
- pigeon peas (lentils)
- soyabeans
- millet/sorghum
- cotton
- rice

Recommendations of the Expert Workshop, Blantyre, Malawi (21-22 July 1999)

The Expert Workshop agreed upon a set of recommendations and named certain governmental and private organizations that should be responsible for further action. Some of the main recommendations are as follows:

There should be a Task Force to develop a policy framework. The policy should provide a framework for engagement for all stakeholders including government, non-governmental organizations, donors and the private sector in terms of areas of diversification. The Workshop nominated ten individuals to the membership of the Task Force.

The institutional framework for marketing of agricultural produce should be reviewed and developed. This should include elements of value-adding, marketing and risk management strategies, including insurance and grain stock exchange.

Responsible institutions: Ministry of Agriculture and Irrigation, Agricultural Development and Marketing Corporation and Malawi Export Promotion Council, with Ministry of Agriculture and Irrigation being the lead agency.

Community-based associations to deal with credit, mechanization, transportation and marketing should be developed.

Participating institutions: Ministry of Commerce and Industry, Ministry of Agriculture and Irrigation, Agricultural Development and Marketing Cor-

poration and the Malawi Rural Finance Company, with the Ministry of Commerce and Industry in the lead.

The function of trade representation/promotion offices in countries which are Malawi's major trading partners should be reviewed with a view to strengthen their capacity to promote the country's competitiveness in the world market.

Responsible institutions: Ministry of Foreign Affairs in the lead, supported by Ministry of Commerce and Industry, Malawi Investment Promotion Agency, Exporters Association of Malawi and Malawi Export Promotion Council.

The National Livestock Development Master Plan should be implemented to provide a framework for investment by the private sector and other stakeholders. More benefits to the animal feed industry would emanate from a well-developed livestock industry.

Responsible institutions: Ministry of Agriculture and Irrigation, Ministry of Commerce and Industry and all associations in the livestock sector, with Ministry of Agriculture and Irrigation to assume leadership.

Land policy and Acts to be amended to allow for the development of land markets and increased access to this scarce resource.

Participating institutions: Department of Lands and Valuation, and Ministry of Agriculture and Irrigation, with the former in the lead.

Contract farming and out-growers schemes to be revisited with a view to increasing accessibility of resources-poor households to credit, factor inputs and also to assure a ready market outlet for agricultural produce.

Responsible institutions: Ministry of Agriculture and Irrigation, Agricultural Development and Marketing Corporation and Growers' Associations, with Ministry of Agriculture and Irrigation in the lead.

Review the Trade Protocol of the Southern Africa Development Community, the Trade Protocol of the Common Market for East and Southern Africa and various bilateral trade agreements with a view to strengthening the trading position of Malawi in the region.

Responsible institutions: Ministry of Commerce and Industry, Malawi Export Promotion Council, Exporters Association of Malawi and Malawi Investment Promotional Agency, with Ministry of Commerce and Industry in the lead.

Mechanisms for encouraging mechanized smallholder farming should be developed. Possibilities of group farming should be assessed.

Responsible institutions: Ministry of Agriculture and Irrigation, Bunda College (especially the Agricultural Engineering Department), Malawi Investment Promotion Agency, and growers and livestock associations, with Ministry of Agriculture and Irrigation in the lead.

Market intelligence and forecasting of market trends should be institutionalized to provide farmers, processors, traders, policy makers, planners and analysts with indicators for imminent changes in the national, regional and international economic and socio-political environment.

Responsible institutions: Malawi Export Promotion Council, Malawi Chamber of Commerce and Industry, Malawi Investment Promotion Agency, Min-

istry of Foreign Affairs/Foreign missions and Ministry of Agriculture and Irrigation (Planning Division), with Malawi Export Promotion Council in the lead.

Market potential profiles should be available for both the foreign and domestic markets for the priority products/crops.
Responsible institution: Malawi Export Promotion Council.

Market intelligence, forecasting and dissemination capacity of the Malawi Export Promotion Council should be strengthened through provision of technical and financial support.
Responsible institutions: Malawi Export Promotion Council, Ministry of Agriculture and Irrigation and Ministry of Commerce and Industry, with Malawi Export Promotion Council in the lead.

The availability of adequate financing to private sector support institutions such as Malawi Investment Promotion Agency, Malawi Export Promotion Council, Malawi Chamber of Commerce and Industry, research institutions, Bunda College and the like should be ensured so that they can undertake their program activities effectively.
Responsible institutions: Ministry of Finance, Malawi Chamber of Commerce and Industry, and Ministry of Agriculture and Irrigation, with Ministry of Finance in the lead.

UNCTAD Secretariat
May 2001

CHAPTER I

REVIEW OF AGRICULTURAL ASPECTS OF DEVELOPMENT OF AGRICULTURAL ALTERNATIVES TO TOBACCO PRODUCTION AND EXPORT MARKETING

1.1. Introduction

Malawi's export base is predominantly agricultural with tobacco contributing approximately 65 per cent of the country's export earnings, followed by tea (8 per cent) and sugar (6 per cent), as seen in table 1. The country has long depended on tobacco as a major foreign exchange earner and has faced great difficulties to find suitable substitutes for this commodity, both in terms of value and adaptability to many geographical locations.

Table 1

Principal export products, 1993-1996

(in local currency and percentage)

	1993		*1994*		*1995*		*1996*		
	Value (K millions)	*Per cent*	*Value (K millions)*	*Per cent*	*Value (K millions)*	*Per cent*	*Value (K millions)*	*Per cent*	*Mean per cent*
Tobacco	938.01	67	2,241.20	69	4,051.00	62	4,935.23	62	65
Tea	156.96	11	261.20	8	427.75	7	496.83	6	8
Sugar	68.78	5	228.68	7	481.66	7	498.16	6	6
Cotton	9.02	1	15.00	0	57.71	1	324.00	4	1
Groundnuts	0.00	0	0.00	0	3.96	0	9.96	0	0
Rice	0.00	0	8.00	0	25.31	0	25.00	0	0
Coffee	34.90	3	127.30	4	261.53	4	288.62	4	4
Pulses	5.98	0	13.00	0	125.90	2	240.45	3	1
Maize	0.00	0	16.80	1	80.53	1	0.00	0	1
Other exports	142.96	10	273.60	8	856.20	13	899.01	11	11
Total domestic export	1,356.35	97	3,184.78	98	6,371.55	97	7,717.26	98	97
Re-export	40.24	3	68.90	2	187.63	3	191.38	2	3
Total	1,396.58	100	3,253.68	100	6,559.18	1.00	7,908.64	100	100

Source: Adapted from Ministry of Economic Planning and Development, Treasury and Reserve Bank of Malawi, 1998.

Notwithstanding the importance of tobacco as a major source of foreign exchange and as a means to alleviate poverty country-wide, an examination of production statistics in table 2 indicates that the value of the crop in real terms (US $/kg) improved in the late 1980s to 1991, only to decline between 1992 and 1995. Output, especially that of burley tobacco, increased after removal of the restrictive Special Crops Act in 1989, which reflects the increased number of smallholder growers and intermediate buyers as well as a rise in the hectarage grown by the estate subsector due to changing comparative advantage between

the burley crop and flue-cured tobacco. It can thus be argued that the increase in tobacco output after the repeal of the restrictive Special Crops Act in 1989 was induced by the inherent comparative advantage of burley tobacco relative to other crops and not by an increase in the real value of the crop.

Table 2

Burley and flue-cured tobacco production, 1988-1996

	Burley tobacco			*Flue-cured tobacco*		
	Volume (tonnes)	*Av. price (US $/kg)*	*Total value ('000 US $)*	*Volume (tonnes)*	*Av. price (US $/kg)*	*Total value ('000 US $)*
1988	45,544	2.04	98,910	20,743	2.05	42,523
1989	61,212	1.34	82,025	19,748	1.82	35,942
1990	64,019	1.88	120,356	21,653	2.38	51,534
1991	75,013	2.42	181,531	25,474	2.87	73,111
1992	99,224	1.80	178,603	25,354	2.27	57,554
1993	103,332	1.10	113,665	25,264	1.33	33,601
1994	71,342	1.29	92,032	20,413	1.55	31,641
1995	101,239	1.48	149,833	19,704	1.85	36,452
1996	117,937	1.61	189,879	15,299	2.28	34,882

Source: Tobacco Association of Malawi.

Although concerns for poverty reduction are appreciated and entry of smallholder production is welcome, there is mounting fear that over-production may ultimately result in loss of quality and decline in the world price of burley tobacco. These fears are not altogether unwarranted, considering that Malawi is a major world producer of burley tobacco. The World Bank estimates that the full effect of liberalization would be a decline in world prices by about 28 per cent in the short run and 9 per cent in the long run. The negative income effects of such a decline in the world price would be more severe in Malawi than other countries, since burley tobacco contributes substantially to farmers' household income and the country's foreign exchange earnings. In addition, the negative effects of tobacco production resulting from deforestation and environmental degradation, especially reduction in biodiversity and siltation of rivers and lakes, need to be weighed against the benefits in the long run.

Dependence on one crop has also been a main problem addressed in the structural adjustment programme supported by the World Bank and IMF ever since it was launched in the country. Considering the increase in anti-smoking campaigns in Western countries and the associated reduction in demand for tobacco, as well as the recently launched work of an Intergovernmental Negotiating Body on drafting a WHO Framework Convention on Tobacco Control, the need to diversify out of this crop, as a major source of economic livelihood and foreign exchange, is evident. Diversification into other lucrative crops such as spices and oilseeds has been repeated in several donor-Malawi Government dossiers as a means to address deep-rooted structural weaknesses of the economy.

The need to diversify away from tobacco is further demonstrated by the declining efficiency of resource use as evidenced by a rise in DRC ratio between 1994 and 1997 from 0.28 to 0.50 for estate burley tobacco and from 0.32 to 0.36[1] for smallholder burley tobacco (Jaffee, 1997). The purpose of this study is therefore to explore the country's possibilities for diversifying beyond tobacco, identify the limiting factors and propose future policy, strategies, and institutional options. A synthesis of literature on diversification and in-depth interviews of purposively sampled stakeholders form a basis for this report.

[1] DRC = Domestic Resource Cost ratio is a measure of the contribution of value added to the domestic resource. See detailed discussion in section 1.3.

1.2. The Importance of Tobacco to Malawi's Economy

Tobacco is the most widely grown crop after maize, covering more than 150,000 hectares. Burley and flue-cured tobacco are the most widely grown tobacco varieties. Except under special schemes, such as the Kasungu Flue-Cured Tobacco Authority, estates grow flue-cured tobacco. This is mainly due to high capital outlay required to grow and process the crop before sale. The cost implications have made burley production the preferred crop by most smallholder farmers after the repeal of restrictions on the growing of this crop in 1989. Since smallholders were permitted to grow the crop, total output has nearly doubled, as seen in table 2, and Malawi accounts for about 20 per cent of the total world production of burley tobacco (Keyser, 1997).

Approximately 250,000 labourers and 282,000 tenants are employed in the tobacco industry, which also supports 1.1 million people. In 1997, a total of 157 thousand tonnes of all types of tobacco were sold representing US $249 million. The output sold in 1998 was 11.4 per cent higher than in 1997. Of the total quantity sold, approximately 133 thousand tonnes were burley tobacco, 16.7 thousand tonnes of it from smallholder farmers. The total sales for burley in 1998 were about US $204 million, of which approximately $26 million or 12.8 per cent was received by smallholder farmers.

Estimates by the Estates Land Utilization Study (ELUS) show that there are about 30,000 tobacco estates with an average size of 35 ha, ranging from 10 to 10,000 ha. Around 88 per cent of these are less than 40 ha and 67 per cent less than 20 ha, as seen in table 3. The average size of estates declined form over 200 ha in the 1970s to about 50 ha by the end of 1980s and in recent years most of them have been less than 20 ha. The structure of the tobacco estates is thus heavily skewed towards small and medium size, i.e., below 40 ha.

Table 3

Percentage of tobacco estates by size categories

Estate size groups (ha)	*Percentage*
10 < 20	67
20 < 40	21
40 < 100	7
100 < 500	5
> 500	2

Source: Estates Land Utilization Study (ELUS), 1995.

1.3. Conceptual and Methodological Framework for Diversification

Jansen and Hayes (1994) define agricultural diversification as the altering of the structure and conduct of the agricultural sector in order to obtain some desired effect on its performance, for example, raising productivity and reducing poverty. Apart from mitigating the hazards of adverse weather conditions such as drought, hailstorms, floods, and outbreaks of pests and diseases, diversification is a hedge against income loss resulting from domestic or world price fluctuations. Diversification also allows for production of commodities that would otherwise be imported, thereby saving foreign exchange and improving the balance of payments.

In principle, farmers' choice to engage in any business venture is predicated on the relative profitability and return to investment among competing enterprises within a given time period. However, food security concerns among subsistence and semi-subsistence households tend to override economic rationale for resource allocation. At the national level, efficiency, equity and sustainability concerns influence policies and strategies on resource use. Developing sound criteria on which an effective and sustainable agricultural diversification strategy should be based is the major challenge facing all stakeholders, including planners, policy makers and donors in Malawi.

Opportunities to diversify out of tobacco production can be analyzed using gross margins, which are a crude measure of profitability depicting the difference between gross revenue and cost of variable factors. Gross margins of a number of enterprises in the country have been estimated and disseminated through the "Guide to Agriculture" by the Ministry of Agriculture and Irrigation. The Agricultural Research and Extension Trust (ARET), Keyser (1997) and Jaffee (1997) have also undertaken an exercise of updating gross margin estimates in recent times. These are simple to estimate and interpret and therefore effective in extension education among smallholder farmers, most of whom are illiterate. However, by their very nature, gross margins ignore the contribution of fixed capital and depreciation to profitability of competing enterprises and thus overestimate the degree of competitiveness. In addition, gross margin analysis, even after accounting for cost of fixed capital and depreciation, fails to capture competitiveness to resource use between one enterprise and another, although it measures opportunity cost between them, *ceteris paribus.*

The use of investment appraisal indicators such as return to investment (Jansen and Hayes), Internal Rate of Return (IRR), Benefit/Cost (B/C) Ratio and Net Present Value (NPV) is one way of overcoming the limitation in gross margin analysis. Benefit/Cost techniques are widely used in loan and investment appraisal as well as project impact analysis (ex-ante and ex-post), (see Mataya and Materechela (1995), Maxwell Stamp (1994) and C. C. L Consulting Services (1998)). Unfortunately, a comprehensive estimate of such indicators, on which a comparative analysis of a wide range of current and potential agricultural enterprises can be based, is not available. Like gross margin analysis, investment appraisal techniques do not adequately capture comparative advantage of resource use between competing enterprises.

Efforts to identify an objective and yet simple criteria for comparing diversification options have led to the development of "Policy Analysis Matrix" (PAM), a methodology which utilizes the contribution of value added to the use of domestic resources by alternative enterprises known as the "Domestic Resource Cost" ratio (DRC), which is a measure of efficiency. As discussed in Monke and Pearson (1994), the DRC is a ratio between unit cost of domestic resource and the difference between revenue and cost of imported inputs, i.e.,

DRC = (Cost of Domestic Inputs) ÷ (Revenue - Cost of Import Inputs)

A DRC value of less than one indicates that the production system is socially efficient since the value added for the enterprise exceeds the domestic cost of production whereas a value greater than one indicates that the system is socially inefficient. The DRC ratio measures comparative advantage between alternative enterprises such that, the lower the DRC, the higher the comparative advantage, and vice versa. As a country embarks on diversification, a question that often arises is whether to export a product or to produce as an import substitute and save foreign exchange. In order to determine whether to export or not, an export parity price (FOB) is used in estimating the DRC, whereas a decision to produce for import substitution purposes is based on a DRC that is estimated using an import parity price (CIF). In both cases, the lower the DRC, the higher the comparative advantage for a country to engage in the production of a particular commodity.

The Policy Analysis Matrix also can be used to indicators and measures of policy or market distortions which constrain producers in engaging in potentially profitable enterprises. These include nominal and effective protection coefficients.

In the absence of such distortions, social and private profitability of an enterprise are expected to be equal. The purpose of estimating such indicators is to identify constraints which policy makers and/or market institutions can remove in order to improve competitiveness of an enterprise locally or internationally. A number of studies have used this methodology to explore agricultural diversification prospects for Malawi (see Nakhumwa (1995), Jaffee (1997) and Keyser (1997).

The use of DRC as a measure of comparative advantage has some inherent weaknesses, considering that the ratio is based on estimates of opportunity costs or shadow prices which change over time, depending on changes in domestic and international market forces and terms of trade. As observed by Jansen and Hayes (1994), PAM is not a behavioral model and it can not be used to calculate new quantities of outputs and inputs that would follow from changes in national opportunity-cost or prices, such as those resulting from policy changes mandated under the agricultural sector strategy currently in use. Estimation of post adjustment PAMs using expected prices from a behavioral model would overcome this weakness.

The methodology also fails to incorporate multiple objectives when identifying options for diversification. While efficiency in resource use is important, policy makers often consider non-efficiency criteria, such as food security and environmental sustainability, as equally important in formulating agricultural development strategies. A Multiple Objective Policy Analysis Matrix (MOPAM), which uses weighted scores for competing stakeholders' objectives in the selection of alternative enterprises, has been used by Jansen and Hayes to resolve the problem of conflicting goals. The procedure estimates standard PAM coefficients for each enterprise, then assigns values ranging from 1 to 5 to each of the multiple objectives for each of the enterprises depending on their importance, 1 being least important and 5 being most important. Intuition and consensus are employed to rank and value objectives which are not quantifiable. If there were 10 objectives per activity, 50 would be the highest possible MOPAM score and 10 the lowest score for each enterprise. Since the DRC score is one of the objectives in the selection of potential activities, commodities with high potential for value-added generation (low DRC coefficient) would be assigned high scores, indicating the importance of efficiency, and vice versa.

The methodologies discussed are more suitable for analyzing production potential than marketing potential of competing commodities. Specific indicators are available for determining the latter. In a study on trade opportunities in Southern Africa by the International Trade Centre UNCTAD/WTO (1994), indicators of growth potential, competitiveness and positioning in comparison with trading partners' imports were used to identify sectors and product groups for trade development in the Southern African Region (SAR).

Import demand of specific products in the target market and export growth of the same commodities in the supplier country, plotted in a two dimensional Euclidean space, provide a dynamic indicator for intra-sub-regional market penetration, as seen in figure 1. Circles in figure 1 represent product groups. The larger the circle the greater the share of the product group in total trade.

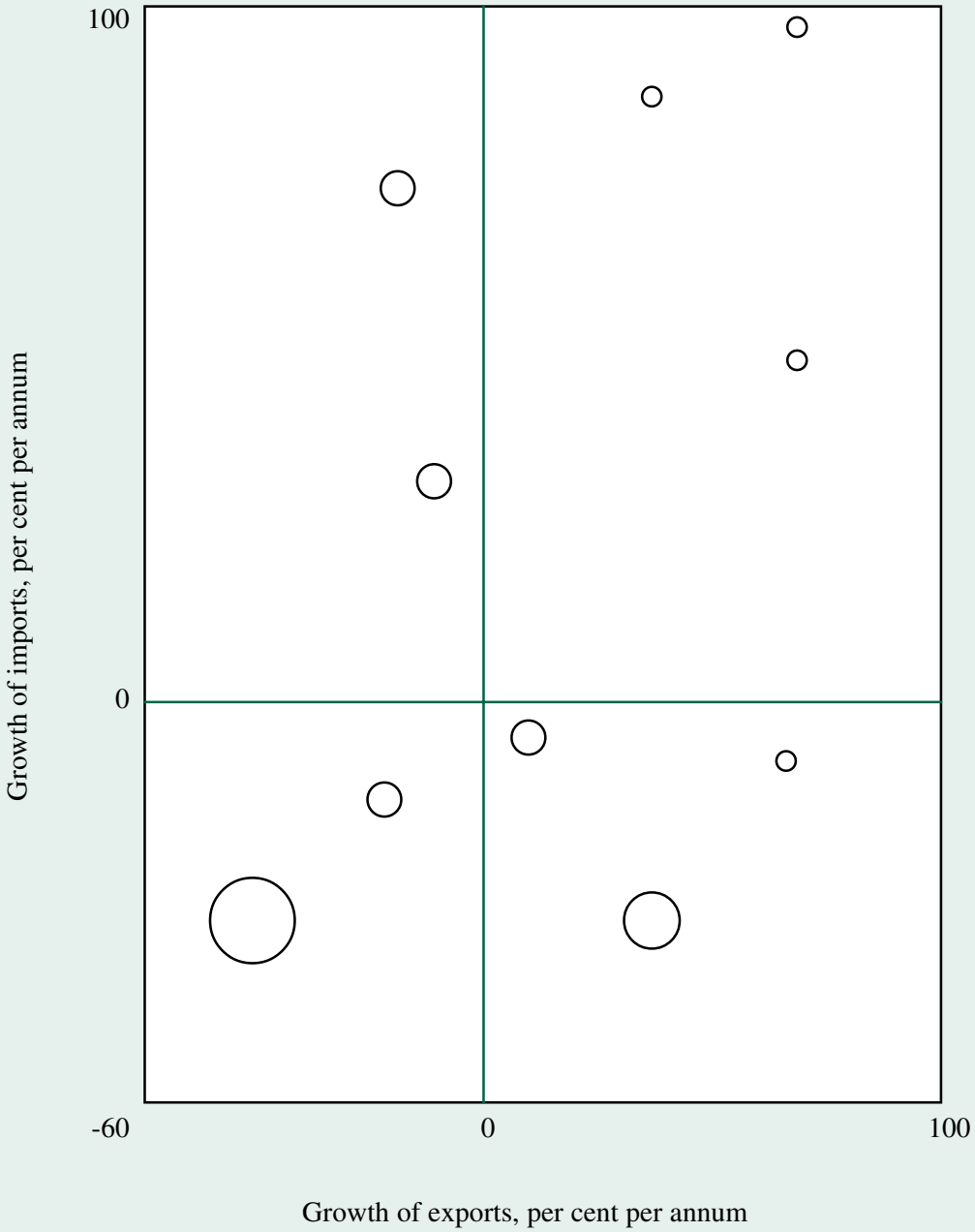
Products situated in the upper right quadrant show greater potential, combining increasing import demand in the target market and export growth in the supplier country, whereas products situated in the upper left quadrant indicate import demand in the target market but for which the corresponding supply capacity in the exporting country is insufficient or unexploited. The lower quad-

rants indicate a contracting or stagnating target market. Market penetration for products situated in the lower quadrants are generally considered the least attractive option for trade expansion strategy.

Trade potential can also be demonstrated through descriptive statistics that show trade flows between countries. A number of organizations and authors,

Figure 1

Hypothetical trading opportunities for a country



Source: Adapted from International Trade Centre, UNCTAD/WTO, "Trade Opportunities in Southern Africa", Geneva, 1997.

including UNCTAD (1998), Maxwell Stamp (1994), Murugan (nd), Husain (nd), EUROSTAT (1998) and ITC (1999), have provided useful information on the status of supply and demand for various commodities in several world markets.

The analyses of production and trading prospects for Malawi, which follow in sections 1.4. and 1.5., are based on both analytical and descriptive frameworks presented in this chapter.

1.4. Production Prospects of Alternatives to Tobacco

Preliminary recommendations on agricultural diversification options, based on an exercise of the Diversification Working Group in Malawi, which appears in Jansen and Hayes (1994) as seen in tables 4 and 5, suggest that pulses and oilseeds have greatest potential in terms of income generation in both domestic and export markets. However, low investment in these crops could partly be due to low technical knowledge. Although cereals and root crops have a poor export market potential, their prospects for household income generation in local markets are quite high, especially when food security and recurring droughts are taken into consideration. Local and foreign market potential for most of the industrial com-

Table 4

Indicative diversification commodities, characteristics and prospects

Characteristics & prospects	*Cereals & root crops*	*Pulses, oilseeds*	*Livestock*	*Tree nuts*	*Orchards*	*Horticulture & sericulture*
Technical knowledge	Low	Low	Medium	Medium	High	High
Investment	Low	Low	Medium	Medium	High	High
Risk	Low	Low	Medium	Medium	High	High
Domestic market	Good	Good	Good	Limited	Limited	Limited
Export markets	Poor	Good	Poor	Medium	Medium	Medium

Source: World Bank, "Agricultural Sector Memorandum", cited in Jansen and Hayes, "Agricultural Diversification, Part I: Methodological Framework and Indicative Results", and "Part II: Analysis of Diversification Options and Constraints", 1994.

Table 5

Likely participants in diversification

Sub-sector	*Cereals & root crops*	*Pulses, oilseeds*	*Livestock*	*Tree nuts*	*Orchards*	*Horticulture & sericulture*
Resource poor						
Commercial smallholder						
Small estates						
Large estates						
Agroprocessing						

Source: World Bank, "Agricultural Sector Memorandum", cited in Jansen and Hayes, "Agricultural Diversification, Part I: Methodological Framework and Indicative Results", and "Part II: Analysis of Diversification Options and Constraints", 1994.

modities, such as tree nuts, and orchard, horticultural and sericultural crops, is rated limited to medium and highly risky. As can be observed in table 5, participation of smallholder farmers and small estates in these crops is also limited. However, the market potential in both local and foreign markets for all the enterprises under consideration including livestock is likely to improve by introducing agro-processing activities.

These preliminary recommendations can not be relied upon as a basis for diversification on two counts. Firstly, time has elapsed since they were proposed seven years ago such that the relative profitability of the proposed activities has changed. Secondly, the framework upon which the relative importance of each activity was determined is not clearly defined.

Using gross margin as an index of profitability, a study by ARET cited in Luso Consult (1995) shows that cultivation of horticultural crops is a potential alternative source of income to tobacco production. Under good management and with no marketing constraints, a smallholder farmer is capable of generating K 231,234 per hectare from tomato production, K 180,509 and K 25,010 from growing of leafy vegetables and onions, respectively, as seen in table 6. Results of a sensitivity analysis suggest that growing of horticultural crops, especially leafy vegetables, tomato, Irish potato and bananas, would still be profitable even after prices have dropped by 50 per cent in case of tomatoes and 75 per cent for all other crops, and that profitability in maize and cotton production could improve with removal of distortions after market liberalization. Findings from LUSO Consult indicate that:

(a) Horticultural crops are more profitable than cereals and grain legumes under good management; and

(b) It would take a huge deterioration in the terms of trade before horticultural crops become unprofitable.

Table 6

Comparison of gross margins of horticultural and other crops grown under smallholder conditions

Horticultural crops	*Gross Margin*	*Gross Margin at reduced prices*
	K/ha	*K/ha*
Tomato	231,234	42,084
Leafy vegetables	180,509	85,694
Onion	25,010	(31,690)
Irish potato	12,782	2,782
Citrus (Mangochi)	8,740	(4,333)
Banana, Thyolo (village sale)	7,500	3,750
Head cabbage	3,178	(2,972)
Non-horticultural crops		
Hybrid maize	(25)	1,595
Cotton	667	1,567
Soyabean		234
Groundnuts		779

Source: Agricultural Research and Extension Trust, cited in LUSO Consult, "Promotion of Horticulture, Malawi, Report Submitted to the Technical Cooperation: Republic of Malawi - Federal Republic of Germany", Hamburg, 1995.

As discussed earlier, use of gross margin analysis alone is inadequate in identifying competitiveness among alternative activities. Thus, results of a more comprehensive analysis by Jansen and Hayes (1994) based on Multiple Objective Policy Analysis Matrix (MOPAM) scores, DRCs, return per hectare, man-days per hectare and net policy effects of a broad array of agricultural enterprises (see tables 7 and 20) are reviewed below.

Jansen and Hayes estimated a total of 109 MOPAMs, although only 32 individual crop/livestock activities were analyzed. Of these MOPAMs, 54 represented smallholder activities, whereas 55 represented estate subsector activities. In-

dicators for the year 2000 for commodities, whose farm budget projections were available, were also estimated.

Among the smallholder enterprises, 47 out of 54 activities had DRCs of less than one whereas 27 activities had less than 0.5. Comparative advantage for commodities with DRC coefficients of less than 0.5 is likely to persist even with lower border prices or lower yields. These crops include burley tobacco sold through the auction floors, the Northern Division Dark Fired Tobacco (NDDF), cotton, groundnuts and soyabeans. Horticultural crops, such as onions, tomatoes and cabbage, are also included in this category. Import parity DRCs for hybrid, local and composite maize varieties suggest that maize should not be grown for the export market, but rather as an import substitute.

Domestic Resource Cost ratios for livestock indicate that Malawi does not have comparative advantage in this subsector and that import-substitution dairy production is the only activity that should be considered for diversification. Potential to diversify into this sector would exist if taxes on imported feed and other factor inputs were removed.

Table 7

List of diversification options

	Activity	*Smallholders*	*Low input estates*	*High input estates*
1	Beans (phaseolus)			
2	Beans (guar)			
3	Beef (stall feeding)			
4	Cabbages			
5	Cashews			
6	Chicken (broiler)			
7	Chicken (layer)			
8	Chillies			
9	Cotton			
10	Dairy			
11	Goats (improved)			
12	Groundnuts (confectionery)			
13	Groundnut (oil expressing)			
14	Macadamia			
15	Maize (local)			
16	Maize (composite)			
17	Maize (hybrid)			
18	Onions			
19	Paprika			
20	Pigeon peas			
21	Potatoes (Irish)			
22	Rice (faya)			
23	Roses (irrigated)			
24	Sorghum			
25	Soyabean			
26	Sunflower			
27	Tobacco (burley)			
28	Tobacco (NDDF)			
29	Tobacco (SDF)			
30	Tobacco (Sun-air-cured)			
31	Tomatoes			
32	Wheat (irrigated)			

Source: Jansen, D., and I. Hayes, "Agricultural Diversification. Part I: Methodological Framework and Indicative Results"; and "Part II: Analysis of Diversification Options and Constraints", 1994.

Commodity ranking, based on both MOPAM scores and DRC ratios, places beans, tobacco, confectionery groundnuts, sorghum, onions and potatoes highest on the list of potential activities and broiler chickens, goats, beef (stall-feeding) and chilies lowest. Among the legumes, guar beans, pigeon peas (lentils) and phaseolus beans rank highest followed by groundnuts. In terms of commodity ranking by return per hectare and MOPAM score, growing of phaseolus beans is rated highest among all activities.

These results need to be interpreted with care considering changes in market structure and relative prices that have occurred since the study was undertaken. For example, ranking chilies lowest does not reflect the current opportunity cost of resource use in terms of export demand for this crop. The recent

increase in the price of maize, relative to the cost of production, has changed the domestic competitiveness among smallholder and even estate crops. This implies that there is a need to revise the relative profitability of enterprises on a regular basis to provide farmers with information on changes in opportunity cost.

Among 55 estate activities that were analyzed, 43 had DRC coefficients of less than one and 34 had DRC scores of less than 0.5. Commodities that scored highly on efficiency included oilseeds, soyabeans, cotton, groundnuts, macadamia, cashews and paprika. As with the smallholder subsector, burley tobacco was ranked highest. Using both MOPAM and DRC scores, oilseeds were ranked highest followed by paprika and irrigated roses in terms of export markets, whereas maize was ranked lowest, confirming earlier observations that the country has no comparative advantage in the production of maize.

Unlike the smallholder subsector, all the indicators for net policy effects in the estate subsector are negative, implying existence of a high degree of market distortion, principally arising from taxation of export commodities and factor inputs (e.g., animal feeds, and agrochemicals) including capital equipment such as tractors. It should be noted, however, that export taxes on tobacco and tea at the time Jansen and Hayes were writing their report were as high as 8 per cent and have recently been completely removed. This underscores the need to update the relative profitability of all potential activities before making final recommendations on diversification options that the country should consider.

After the study by Jansen and Hayes, comparative analysis studies by Nakhumwa (1995), Keyser (1997) and Jaffee (1997), using mainly PAM and gross margin analysis have contributed to the debate on diversification. The following review of these studies provides a basis for comparison with earlier findings and/or assessing whether competitiveness among potential activities has changed in the last five years.

In the study by Nakhumwa, maize (local and hybrid), groundnuts, burley tobacco, cotton, sorghum and soyabeans were evaluated with respect to their domestic and international prospects and comparative advantage at three technological levels: smallholder, low input and high input estates. Findings in this study indicate that the production of paprika, tobacco, groundnuts, and soyabeans with DRC scores of 0.18, 0.21, 0.23, and 0.37, respectively, under low input technology have strong comparative advantages among the crops considered. Results from the study also support earlier findings that the country has no comparative advantage in the production of maize for the export market. Likewise, observations made by Jansen and Hayes confirm that market distortions, such as taxes on export commodities and duties on factor inputs, have eroded the competitiveness of crops grown by the estate sector. Thus, apart from diversifying out of tobacco, removal of these distortions was expected to improve the competitiveness and performance of the subsector.

In contrast to Jansen and Hayes' study, Nakhumwa's analysis is narrow in focus to the extent that it does not adequately represent alternative farming systems in the country. In this respect, any recommendations made do not reflect a wide range of alternatives available to both estate and smallholder farmers and their opportunity costs.

Keyser's analysis of Malawi's agricultural comparative advantage is much broader and more current than Nakhumwa's, covering a total of 26 crops and livestock products. Although the country is said to be very efficient in the pro-

duction of many agricultural commodities in comparison with other countries of the Southern African Region, the author argues that most crops in the smallholder subsector provide farmers with extremely poor financial returns. For example, 8 of 20 different activities return little more than K 1,000/ha ($65) with average management, 5 activities offer potential income greater than K 5,000 ($327), and most scenarios of maize production return more than K 1,000/ha when saved entirely for home consumption. Keyser observes that high input prices, following market liberalization, have had an adverse effect on input use, yield and profitability. However, the magnitude of the effects of liberalization was not analyzed in this study. The most likely causes for the escalation of factor input prices include lack of competitiveness among distributors, high transport costs, high interest rates and taxes. Lack of bargaining power on the part of smallholder farmers limits their capacity to influence factor and product prices in their favour.

The low income earning potential of most smallholder crops is further exacerbated by small size of area cultivated, which in most case is less than one hectare. This is true with respect to burley tobacco, even though the crop yields substantial returns relative to other enterprises. Keyser's findings have several implications as regards smallholders' access to resources and options for diversification. Firstly, increased income earning potential can not be realized unless commodity prices rise by more than factor input prices, an outcome which market liberalization was expected to accomplish. Secondly, adequate financial returns can not be realized from high value crops such as tobacco, unless there is increased access to capital, labour and land. Increased access to capital requires transformation of financial markets, whereas increased access to land requires land reform. Apart from land reform, increased productivity of maize, which claims more than 55 per cent of cultivable land in the smallholder subsector, is one avenue through which the problem of access to land can be resolved.

According to Keyser, diversification options under smallholder agriculture include production of burley tobacco, cotton and groundnuts as export crops, and soybeans, sunflower, tomatoes and vegetables as import substitution crops. The scope for income generation from cotton, groundnuts, soyabeans and sunflower could be expanded through small-scale and large-scale agroprocessing activities. Dairy production, although requiring high initial capital outlay, is a potential import substitution enterprise in the smallholder subsector.

In the case of estate agriculture, flue-cured tobacco, burley tobacco, clonal tea and tree nuts (macadamia and cashew) offer attractive options for diversification. Floriculture, which has already been introduced in the country, is a potential option among large-scale farmers. However, as Jaffee observes, there is a need to establish a critical mass in order to effectively deal with technical and airfreight problems.

In a study on structural transformation and future prospects for Malawi, Jaffee demonstrates that changes in opportunity cost resulting from market liberalization have set in motion structural shifts in both estate and smallholder agriculture. As can be observed in table 8, the share of maize in the total area cultivated by smallholder farmers between the 1989-1991 and 1995/96 growing seasons declined from 70 per cent to 55 per cent, whereas that of pulses and oilseeds increased from 11 per cent to 20 per cent.

Table 8

Shares of different crops in smallholder plantings

	Share in 1989 - 1991 (%)	*Share in 1995/96 (%)*
Maize	70	55
Pulses and Oilseeds	11	20
Roots and Tubers	6	9
Industrial Crops	4	7
Other Cereals	4	7

Source: Jaffee, S., "Malawi Agriculture: Recent Structural Transformation and Future Prospects," East and Southern Africa Agricultural Division, World Bank, 1997.

The increases in the area planted to roots and tubers, industrial crops and other cereals are also significant. The structural shift in smallholder agriculture has also been confirmed in a similar study by Mataya, Chulu and Chilima (1998). The implication of these findings is that farmers are aware of the changes in comparative advantage among alternative commodities. However, the speed at which they are adjusting to these opportunities depends on their ability to access resources such as capital and land. Resource-poor farmers are unlikely to embark on production of high value industrial commodities which may require high initial capital outlay. Thus, the need for developing effective strategies to support diversification of agriculture on a wider scale is apparent.

Jaffee's study also demonstrates that changes in the relative profitability of agricultural enterprises have made burley production unattractive. Results from this study, some of which appear in table 9, show that growing of burley tobacco was less profitable per hectare than paprika, sugar, coffee, clonal tea, flue-cured tobacco and dairy in the 1995/96 season. The table also shows that maize, together with two oil seeds (soyabeans and sunflower), rank among the lowest of the crops with regard to value added. The profitability of maize is higher under the assumption that it is reserved for consumption. Inter-cropping of maize with either pigeon peas or beans improves the profitability and/or value added per hectare, presumably due to associated improvement in soil fertility. In terms of diversification, growing of tomatoes yields highest financial returns followed by cassava, groundnuts and rice. Among industrial crops, paprika yields highest returns followed by tobacco, coffee and cotton.

As is the case with Nakhumwa's study, Jaffee's analysis focuses on a narrow spectrum of the country's potential alternatives and thus limits the scope for comparison of opportunities to diversify. However, in the author's concluding remarks on the future directions, what he considers **"the Four Pillars"** for broad-based agricultural growth provide a framework for policy debate and development of strategies for sustainable agriculture in Malawi. The four pillars address the following issues:

- the role of burley production in poverty alleviation;
- efficient utilization of land through institutional and organizational reform and enforcement of rules and regulations;
- improved productivity, post-harvest management and trade in food crops; and,
- market-led crop, livestock and value-added product diversification.

Although issues in the pillars address structural weaknesses in Malawi's agricultural-led growth and development, international political and economic relationships ultimately determine the success or failure of country-level policies and strategies. For example, rules and regulations governing trade relations between small open economies and large trading blocks, such as the European Union, determine the extent to which efforts to diversify into growing of fruits and vegetables, manufacturing and other forms of value adding, will bear fruits. Most Western markets are protected by strong technical and health regulations (e.g., rigid phytosanitary requirements), but trade liberalization in developing countries serves to create a free market for products of multinational conglomerates. A case in point is the scaling down of operations or relocation of manufacturing/processing plants from Malawi to neighbouring countries by Lever Brothers in the post-liberalization period. The rationalization of the British American Tobacco (BAT) manufacturing company, in the wake of an influx of competing low

priced cigarettes on the local market, is an example of how prospects of backward linkage and non-agricultural employment generation have been curtailed by asymmetric or unbalanced market liberalization. Unless constraints that limit local and foreign market opportunities are adequately addressed in the debate on diversification, efforts to transform agriculture into a broad-based economic activity will only be stifled.

Table 9

Indicators of smallholder crop profitability and efficiency, 1995/96 season*

Crop	*National returns & efficiency*		*Private returns*				*Possible resource barriers*	
	Value added/ hectare (MK)	*DRC*	*Net profit/ hectare (MK)*	*Gross margin; Variable cost ratio*	*Returns/ man-days (MK)*	*Net Profit/ hectare with improved production (MK)*	*Variable costs / hectare*	*Man-days/ hectare*
Food crops								
Local maize	1,595	0.37	502(846)[1]	0.87	13.85	417(868)[1]	578	74
Hybrid maize	1,964	0.43	401(906)[1]	0.3	11.68	46(1347)[1]	1,354	88
Groundnuts	3,318	0.35	2,075	1.57	26.21	2,662	1,326	107
Cassava	2,850	0.33	2,419	2.91	29.82	3,520	831	109
Beans/L.maize[2]	2,820	0.32	902	0.91	17.68	1,453	989	85
P.peas/L.maize[2,3]	2,306	0.30	489	0.74	12.98	1,067	661	83
Rice(faya/RF)	3,113	0.50	1,019	0.64	21.47	661	1,581	19
Soybeans	446	0.57(0.89)[4]	(342)[1]	(0.23)[1]	1.71	234	1,467	64
Sunflower	962	0.43	287	0.66	11.96	385	433	59
Tomato[5]	51,140	0.17	112,350	14.69	149.99	151,456	7,650	788
Industrial crops[6]								
Tobacco (burley)	10,422	0.32	4,524	1.04	28.04	10,323	4,483	225
Cotton	2,789	0.33	635	0.57	14.24	1,728	1,115	96
Tea[3]	4,662	0.71	(948)[1]	(0.21)[1]	4.35	99	4,548	372
Coffee[4]	4,585	0.27	1,908	2.28	37.91	5,424	915	130
Paprika	17,098	0.23	8,892	1.18	37.91	11,640	7,508	287

* Based on crop budgets/results from the Central Region unless otherwise noted. Except for one column, these results are based on 'average' levels of management performance.

1. Figures in parentheses assume that half of the crop is sold and half is retained for household consumption. Maize held has a higher value than maize sold.
2. Inter-crop.
3. Southern Region.
4. Figure in parentheses is for export parity.
5. Northern region. Note that tomatoes are typically planted on 0.1 hectare or less.
6. Most columns involve a scenario whereby the farmer sells 2/3 of the crop through intermediate buyers and 1/3 direct to the auction. For the 'improved' result all sales are direct to the auction.

Source: Jaffee, S., "Malawi agriculture: Recent structural transformation and future prospects", Background paper for the Malawi Growth Prospects Study, World Bank, Southern Africa Division, Washington D.C., 1997.

Although the studies on diversification in Malawi differ in scope their conclusions are similar, i.e. that the country should diversify out of tobacco and that maize should be grown as an import substitution crop. Generally, burley tobacco, cotton and groundnuts have been recommended as export crops, and soybeans, sunflower, tomatoes and vegetables have been recommended as import substitution crops. There is great potential for macadamia and cashew nuts

as export crops, but the scope for engagement of smallholder farmers is limited due to poor access to capital and land.

Most of the studies reviewed, however, have weaknesses in terms of depth of analysis. For example the studies do not analyze the effects of a change in the production and market structure on comparative advantage, income generation, food security, the environment and natural resources, yet these are crucial to determining the success or failure of a wide-scale change in economic activities. In the second pillar of prospects for broad-based agricultural growth, Jaffee proposes a change in the land/labour relationships (out-growers and in-growers schemes) but he does not provide indications of the magnitude of costs and benefits of the proposed changes to individuals involved and the nation as a whole.

Supply responsiveness to changes in the production and marketing structure has not been analyzed. Indications of changes in the production structure and output levels are important in determining the capacity of processing and value adding the country should build to develop forward and backward linkages. A major problem in Malawi is low productivity. For example, maize, which occupies more than 55 per cent of smallholder cultivable land, yields approximately 1 tonne per hectare while the potential yield is 8 tonnes per hectare. With improved management, less amount of land would be required to grow the same quantity of maize and the excess would be allocated to high value enterprises. There is a need, however, to estimate input-output relationships under alternative production scenarios in order to determine optimal resource use at both household and national levels.

In line with Jaffee's pillars of broad-based agricultural growth, there is a need to define the type of institutions (dealing with markets, land, financial, technical and extension issues) that would need to exist to support the diversified production and marketing system proposed. Creation of competitive market structures should not only be limited to farmers' produce but should extend to labour, financial and land markets. Where this is not possible, there is a need to define rules of engagement that promote efficiency and equity between sellers and buyers of agricultural goods and services.

Choice of criteria for identifying diversification opportunities is very important. Use of gross margins, profit, DRC and MOPAM indicators is adequate as long as comprehensive and accurate farm budget data are available and updated regularly. A difficulty in compiling farm budget data is the estimation of input-output relationships for mixed farming systems and mixed cropping (e.g., inter-planting of maize, beans and pumpkins). The difficulty relates to estimating input use and yield per unit area as well as allocating fixed costs between enterprises. Methodology for estimating contribution of fixed factors to competing enterprises exists (see Keyser, 1997).

Profit, efficiency and MOPAM indicators, as applied in the literature reviewed in this study, do not provide an objective basis for selection of optimal combinations of potential enterprises. Analysis using linear programming, which is a standard technique for constrained optimization, would improve the objectivity of the selection criteria. Several authors, including Chikwana (1982), have used LP-based models to address the issue of diversification and optimization. However, a standard LP model is not appropriate in dealing with multiple objective functions and constraints when there are a number of stakeholders, such as farmers, policy makers, donors and the private sector. An alternative algorithm known as Goal Programming (GP) has been developed to handle such issues.

Goal Programming is classified as a MINISUM method whose underlying principle is the minimization of the sum of undesired deviations (under or over achievement) from goal levels set by the Decision-Maker (DM). As Rehman and Romero (1989) state, GP does not necessarily produce a Pareto optimum solution. Therefore, it is regarded as a model that operationalizes the Simonian approach of 'satisfaction' to the fulfillment of the 'DM's objectives. This methodology has been applied in natural resources management problems in Mozambique (see Nhantumbo, Kowero and Oglethorpe, 1997) and could be applied to the diversification problem in Malawi.

1.5. Marketing Prospects of Alternatives to Tobacco

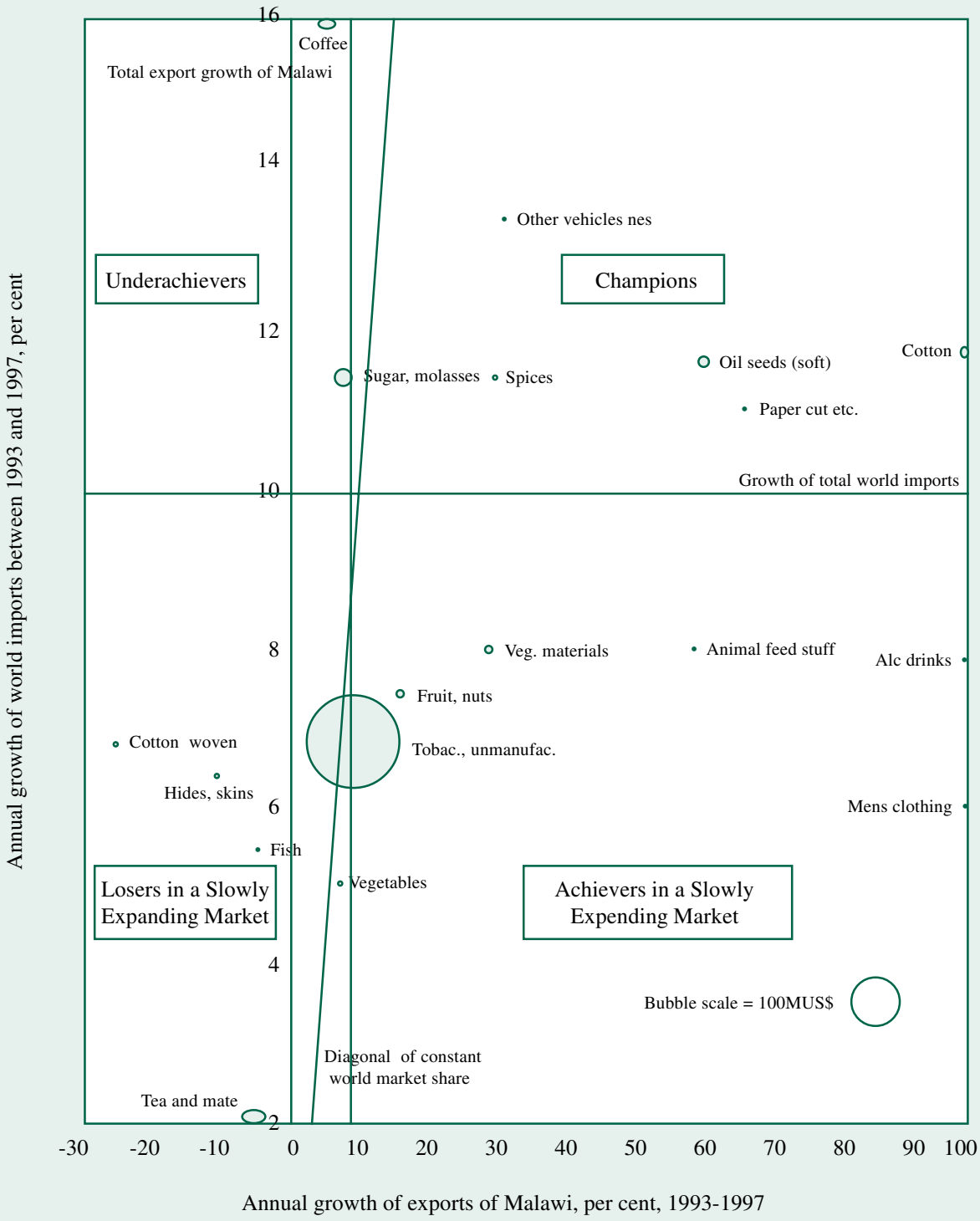
Developing a viable agricultural trade strategy requires determining factors influencing effective demand for a country's produce. Some of the factors are endogenous, meaning that they can be manipulated locally to the country's advantage, while others are exogenous, implying that they are influenced externally and are out of the control of the domestic economy. Major factors, influencing both domestic and foreign demand for produce, include commodity prices, income, taste and preference, and size and structure of the target population. Historical trade statistics on both domestic and foreign consumption provide direct and indirect measurement of the structure and magnitude of demand for given products. This section aims at establishing domestic as well as foreign market prospects for commodities that have been identified in section 1.4. as having potential for diversification. In addition, the section attempts to analyze Malawi's readiness to penetrate the world market for the respective commodities under review.

Growth of national supply and international demand, relative to Malawi's annual growth in exports, is depicted in figure 2 and is used to examine Malawi's trade performance between 1993 and 1997. The chart represents the performance of 20 leading export products for the country, (indicated by bubbles), opportunities and readiness to penetrate the foreign market. The larger the size of the bubble, the larger the market share of the product group. For example, tobacco has the largest bubble, implying that it has the greatest market share relative to other product groups. The horizontal line measures the national export growth relative to the growth of international demand on the vertical axis. As discussed in section 1.3. of this paper, commodities in the upper right quadrant represent products which have performed well in terms of generation of export revenue. These include all the 20 commodities except cotton (woven), fish, tea, and hides and skins. Their placement shows that the country has been able to out-perform world market growth and has increased its share in world markets, an indication of improvement in competitiveness over the period in question. These observations suggest that trade promotion efforts for these products are less risky and therefore the country should aim at broadening the supply capacity.

In addition, the chart indicates the nominal growth of total exports and imports (10 per cent per annum) on both horizontal and vertical axis, as reference lines. The diagonal line, which represents a constant world market share, divides the chart into two. Export product groups to the right of this line have grown faster than world imports and thereby have increased their share in the world market, whereas commodity groups to the left of the diagonal line have experienced erosion of their market share. The former includes cotton, oilseeds, spices, fruits, nuts, unmanufactured tobacco, vegetables, vegetable materials, and animal feed (International Trade Centre (ITC), 1999).

Figure 2

Growth of national supply and international demand for leading exports of Malawi



Note: The area of the circles corresponds to the export value of the product group for Malawi. See explanatory sheet for details.
Source: ITC calculations based on COMTRADE statistics.

Coffee, which is located in the upper part of the right quadrant but left of the diagonal line, is a commodity of particular challenge in terms of trade promotion. Malawi does not appear to have a strong comparative advantage in the production of coffee. While international demand for coffee continues to grow, the country's production has been lagging behind. This represents a loss in international market share. This is a problem of constrained supply rather than limited demand and special efforts should be made to remove the constraints.

Commodities located in the left and right quadrants but below the 10 per cent horizontal reference line have positive rates of growth of world imports and expanding prospects for exports. The former, which include hides and skins, fish, cotton (woven) and tea could be considered losers, while the latter which include fruits, unmanufactured tobacco, vegetables and vegetable materials and animal feed are achievers in slowly expanding world markets, respectively. There is a need to identify constraints on both the demand and supply side in order to increase the country's market share of these commodities. Replacement of traditional tea bushes with clonal tea and organic production of herbal substitutes are potential options to reverse the decline in market share. Anti-smoking campaigns in Western countries help to explain the adverse market situation for tobacco.

Table 10

Value of world imports of selected commodities

	Imports (million US $)				
	Spices	*Vegetables, fresh, chilled & frozen*	*Cotton*	*Rice*	*Cereal grains*
1992	1,536	17,430	6,984	3,552	1,700
1993	1,471	16,319	6,259	3,332	1,570
1994	1,554	18,417	8,374	5,284	1,555
1995	1,738	20,916	10,566	4,302	1,726
1996	1,701	19,216	7,831	4,458	1,850

Source: ITC, 1999.

The significance of the illustrations in figure 2 and the above discussion with respect to Malawi's diversification opportunities, can be better appreciated by examining quantities and trends of world consumption of selected commodities. Commodity groups, such as spices, vegetable, cotton, rice, cereal grains, mushrooms and livestock in tables 10 to 16, illustrate foreign demand and the country's export opportunities.

1.5.1. Spices

World demand for spices, as indicated by the value of imports in table 10, has been increasing steadily over time, suggesting that this is an area worthy of investment. According to table 11, Germany is the major consumer of spices in Europe followed by the Netherlands, France, the United Kingdom and Spain with values of imports estimated at $142.3 million, $91.2 million, $69.4 million and $69.3, respectively. Although India is the single largest consumer of spices, it appears to be self-sufficient and, in terms of distance, it can not be considered a niche market for Malawi. The Middle East and Africa are also potential market outlets for spices. However, their demand is small relative to Europe. In spite of the availability of these trading opportunities, the value of Malawi's exports, as estimated by the International Trade Centre in 1995, was $1.9 million, implying that there is tremendous potential for improvement.

Volumes of spice trade estimated between 1983 to 1987 by the ITC (table 12) indicate the importance and significance of individual types of this commod-

ity in the world market. Pepper is the largest spice by volume traded (125-130 thousand tonnes) followed by capsicum (55-60 thousand tonnes), cinnamon and cassia (33-34 thousand tonnes) and spice seeds (55-60 thousand tonnes). Paprika and chilies, which are gaining economic importance in Malawi, are included in the estimates of capsicum trade.

Table 11

Imports of selected commodities by region, 1996

	Spices (US $ '000)	*Vegetables (US $ '000)*	*Cotton (US $ '000)*	*Cereal Grains (US $ '000)*
Europe				
Germany	142,302	3,682,558	343,152	64,516
United Kingdom	69,392	1,836,945	116,881	13,660
France	76,349	1,544,600	269,949	17,319
Netherlands	91,173	1,420,612	23,005	88,706
Belgium	34,602	784,221	89,561	60,490
Italy	29,104	742,182	786,089	89,849
Spain	69,287	604,582	234,111	171,854
Switzerland	17,953	375,240	77,880	15,354
Sweden	16,643	334,599	22,132	1,982
Austria	20,139	309,040	61,908	14,408
Portugal	8,209	190,084	336,718	13,899
Denmark	15,424	157,998	10,485	11,650
Ireland	6,036	156,930	32,505	1,994
Norway	8,915	115,837	1,824	27,650
Finland	6,846	115,467	5,921	9,742
Greece	*6,636	*114,482	*21,741	*2,095
Middle East				
United Arab Emirates	***55,340	***93,592	***960	***1,258
Saudi Arabia	**36,632	**145,749	**3,749	**297
Kuwait	*12,497	*97,397	-	-
Israel	6,703	32,797	21,753	74,037
Jordan	*4,462	*29,467	*2,717	-
Bahrain	**4,557	**32,876	-	-
Oman	*5,962	*22,509	-	*25
Qatar	**3,454	**23,048	-	-
Africa				
South Africa	*15,207	*48,861	*84,587	*4,007
Egypt	12,797	130,140	46,913	16,313
Morocco	10,893	36,549	81,678	10,091
Algeria	*8,625	*113,627	*32,777	*2,107
Tunisia	2,546	19,414	53,625	397
Mauritius	*1,904	*11,194	*20,192	-
Zimbabwe	*1,202	*9,620	*6,359	*962
Kenya	-	***11,063	**4,781	**8,015

* 1995.
** 1994.
*** 1993.

Source: International Trade Centre UNCTAD/WTO (ITC), COMTRADE Statistics, 1999.

1.5.2. Vegetables (Fresh, Chilled and Frozen)

World demand for vegetables (fresh, chilled and frozen) exhibit a rising trend. The whole of Europe is a niche market for vegetables. However, Germany, the United Kingdom, France and the Netherlands had the largest values of imports, in excess of $1.4 billion each, in 1996. Quantities of imports in the Middle East and Africa are small, but important economically when the cost of transportation is taken into account. Although Malawi's export of vegetables is small, the trend is rising. Estimates by ITC indicate that the country's exports rose from $3.4 million to $8.2 million between 1994 and 1995. Considering the increasing trend in consumption of vegetables, as shown in table 10, an opportunity exists for Malawi to raise foreign exchange through exports of this commodity.

Table 12

Estimated trade in individual spices, 1983-1987

	('000 mt)
Pepper	125–130
Ginger (dry)	15–16
Cardamom (a)	9–10
Cloves (b)	3.5–4
Capsicum (c)	55–60
Vanilla	2–3
Cinnamon and Cassia (d)	33–34
Nutmeg and Mace	12–15
Pimento (allspice)	3–4
Turmeric	15–20
Saffron	0.030–0.050
Spices-seeds	55–60
Curry powder	5–6

(a) Excluding domestic consumption in India of approximately 3,000 tonnes.
(b) Excluding imports into Indonesia, Hong-Kong and Singapore.
(c) Includes trade in paprika, chilies and cayenne pepper.
(d) Cassia accounts for around 90 per cent.

Source: Husain, F. A., "Global Overview of International Trade and Consumption of Spices", International Trade Centre (ITC), nd.

1.5.3. Cotton

Table 1 shows that cotton export, as a share of total export earnings for Malawi, has been rising only marginally, and yet this is an important income generating agricultural activity in the country, especially along the low-lying areas such the Lakeshore and the Lower Shire Valley. For example, between 1993 and 1996, the share of cotton in total exports rose from 0.01 to 0.04 per cent. Major causes contributing to low export volumes include poor price incentives and rising costs of factor inputs, especially chemicals. Although market liberalization has created alternative outlets and potential for competition among buyers of this commodity, relative profitability of other crops such as spices and tobacco have contributed to the decline in importance of cotton as a major source of income among smallholder farmers. However, financial and economic indicators of cotton under large-scale production, as documented by the World Bank (World Bank, 1996) show that the crop is a viable alternative to burley tobacco. The return per unit cost, as measured by the ratio between gross margin and variable cost, is higher for cotton than burley tobacco, 1.52 for the former and 1.27 for the latter. In addition, the DRC ratio for cotton (0.22) is lower than that of burley tobacco (0.29). Thus, large-scale producers can be relied upon as major sources of cotton for export and local consumption.

Until 1996, world market opportunities for cotton were favourable, as indicated by the rising consumption trend between 1992 and 1996 in table 10. In Europe, Italy is the major consumer of cotton followed by Germany, Portugal, France and Spain with values of $786.1 million, $343.2 million, $336.7 million, $270.0 million and $234.1 million, respectively. In the Middle East, Israel is a major consumer with the value of imports estimated at $21.8 million, whereas in the African region, South Africa is the largest consumer with an estimated value of $84.6 million, followed by Morocco ($81.7 million), Tunisia ($53.6 million), Egypt ($46.9 million) and Algeria ($32.8 million).

Estimates by BAHICO (1999) indicate that world supply of cotton slightly exceeds demand. Whereas total production in 1997/98 was estimated at 19.9 million tonnes, consumption was estimated at 18.7 million tonnes. The excess supply probably explains the falling international cotton price trends (BAHICO).

Factors influencing declining world demand for cotton include accumulation of unsold stocks of yarn in Europe, reduction in production levels of yarn in Turkey in spite of increased investment in the textile industry, and closure of yarn spinning mills in Thailand. Competition from low-priced polyester has made yarn selling rates unremunerative. Economic downturn in East Asian economies triggered by currency devaluation has further contributed to declining world demand for cotton. The implication of these observations is that the world cotton market is highly competitive and Malawi needs to develop effective strategies to penetrate. Since the market outlook is not as bright as currently perceived by many analysts, the country should lay more emphasis on meeting domestic demand with a view to reducing imports by the local textile industry.

Table 13

Imports of fresh and dried fruits and nuts by country, 1992-1996

	1992 (US $ '000)	*1993 (US $ '000)*	*1994 US $ '000)*	*1995 (US $ '000)*	*1996 (US $ '000)*
Europe					
Germany	4,951,216	3,899,597	4,703,393	5,521,826	5,386,923
United Kingdom	2,442,662	2,004,838	2,259,987	2,515,005	2,812,589
France	2,546,698	2,125,134	2,374,863	2,648,194	2,512,129
Netherlands	1,350,567	1,239,994	1,511,269	1,610,009	1,642,673
Italy	1,217,143	856,977	1,090,098	1,164,785	1,265,163
Belgium-Luxembourg	752,747	651,444	825,017	885,699	1,246,516
Spain	510,837	367,603	515,536	674,097	757,592
Switzerland	591,173	555,608	639,113	617,536	609,527
Sweden	484,938	394,244	452,572	434,278	528,404
Austria	490,066	446,298	477,097	475,338	507,222
Portugal	146,610	201,565	253,136	277,652	290,129
Denmark	226,038	186,116	225,728	232,452	264,548
Finland	239,039	203,203	295,022	213,448	263,667
Ireland	140,033	123,918	139,129	146,832	161,393
Greece	82,405	71,562	118,659	149,652	
Middle East					
Saudi Arabia	249,923	314,632	314,719		
United Arab Emirates	146,386	188,283			
Kuwait	82,968	97,903	109,507	109,599	
Israel	53,239	52,908	63,884	79,436	81,188
Oman	68,758	67,975	62,274	52,201	
Bahrain			34,632		
Qatar	28,499	26,294	26,025		
Jordan	31,480	14,604	10,631	24,779	
Africa					
South Africa	14,573	24,024	15,384	21,361	
Algeria	10,753	1,163	2,925	36,263	
Egypt			29,160	29,772	31,518
Morocco		3,764	3,177	8,364	12,622
Tunisia	7,233	6,244	14,116	20,548	10,908
Mauritius	8,699	10,150	10,692	10,566	
Zimbabwe	153	626	2,222	2,657	
World Total	*25,548,725*	*23,118,575*	*26,413,861*	*28,667,490*	*28,628,804*

Source: International Trade Centre UNCTAD/WTO (ITC), COMTRADE Statistics, 1999.

1.5.4. Fresh and Dried Fruits and Nuts

World demand for fresh and dried fruits and nuts between 1992 and 1996 has risen by 12 per cent from $25.55 billion to $28.63 billion, as seen in table 13. Germany is the largest importer of these products with an estimated value of $5.39 billion, followed by the United Kingdom ($2.81 billion), France ($2.51 billion) and the Netherlands ($1.64 billion). In the Middle East, Saudi Arabia is the largest importer, followed by the United Arab Emirates and Kuwait. However, their quantities are less than a billion US dollars. African countries, the major ones being South Africa, Algeria, Egypt, Tunisia and Morocco, import significant quantities of fresh and dried fruits and nuts. Although the world demand for these commodities has been rising in the 1990s, Malawi's export performance, especially for groundnuts (see table 1) in which it has a comparative advantage, has been poor. This reflects government's failure to develop appropriate policies and strategies for promoting the production of commodities whose world demand is rising.

1.5.5. Oil Seeds (Soft)

A rising trend for world imports of oil seeds (soft) is observable from table 14. The major consumers of these products in Europe include the Netherlands ($1.85 billion), Germany ($1.39 billion), Spain ($960 million), Belgium ($581 million) and the United Kingdom ($571 million).

Among the Middle Eastern countries, Israel is a major consumer of oil seeds with an estimated import value of $179 million, followed by Saudi Arabia and Jordan. In Africa, Morocco, South Africa and Algeria are the largest importers with values of $89.60 million, $68.71 million and $66.74 million, respectively. According to figure 2, location of oil seeds in the upper right quadrant indicates that Malawi has uncaptured potential in the world market. Again, this observation underscores the need to develop effective strategies for penetrating regional and world markets with growing demand.

1.5.6. Cereal Grains

World consumption of cereal grains declined slightly between 1992 and 1994 from $1.7 billion to $1.6 billion and increased to $1.9 billion in 1996. Five major importers of cereal grains in Europe include Spain ($172.0 million), Italy ($89.8 million), the Netherlands ($88.8 million), Germany ($64.5 million) and Belgium ($60.5 million). Israel is a major importer of the product in the Middle East with an estimated value of $74.0 million, whereas Egypt and Morocco are the largest importers in Africa, as seen in table 11.

In Malawi, cereal production is dominated by maize, which is the main staple in most parts of the country, but has a low comparative advantage among competing commodities. In recent times, domestic production has not kept pace with demand such that huge quantities of maize have had to be imported to meet the production gap. During the 1997/98 season, the country imported 35,528.3 tonnes of maize at an average price of US $ 225/tonne. This implies a huge drain on foreign reserves, necessitating measures to produce maize and other cereals as import substitution crops.

1.5.7. Mushrooms

A study to determine the production and export potential of mushrooms was undertaken by the Malawi Export Promotion Council (Banda and Chigwenembe 1994). Results of their findings, as shown in table 15, indicate that there were ten farmers of mushrooms around the Bvumbwe/Kwenengwe catchment area who grew three varieties: TNS1, TNS2 (Agaricus bisporus) and K26. The average yield per farmer ranged from 5 to 10 kg per square meter. Domestic production was very small, estimated at 6.5 tonnes per year. The findings also revealed that the country's demand for mushrooms was 80 tonnes, necessitating importation mainly from South Africa and Hong-Kong. According to Banda and Chigwenembe, mushrooms are easy to grow, using simple adopted technology, and do not re-

Table 14

Import value of (soft*) oil seeds by country, 1992-1996

	1992 (US $ '000)	*1993 (US $ '000)*	*1994 (US $ '000)*	*1995 (US $ '000)*	*1996 (US $ '000)*
Europe					
Netherlands	1,435,927	1,142,311	1,862,858	1,648,776	1,849,643
Germany	1,269,258	1,199,332	1,342,999	1,330,140	1,394,905
Spain	743,065	635,469	677,165	987,367	960,238
Belgium-Luxembourg	698,615	446,125	589,713	625,836	581,238
United Kingdom	376,370	374,136	442,406	464,218	570,754
Italy	400,893	450,690	432,382	430,165	394,455
France	245,474	227,240	404,579	355,363	392,378
Portugal	279,370	217,375	244,906	318,994	313,776
Greece	113,827	110,139	119,894	115,240	
Norway	67,567	10,222	65,344	86,122	106,485
Denmark	45,540	55,230	70,615	98,214	99,114
Finland	48,255	39,961	42,632	65,731	71,122
Sweden	19,834	12,121	31,004	42,122	65,638
Switzerland	44,278	35,517	49,138	48,858	52,814
Ireland	7,241	8,310	6,896	5,919	10,912
Middle East					
Israel	146,049	148,440	132,620	160,237	179,265
Jordan	10,089	10,718	7,941	13,553	
Saudi Arabia	29,918	84,247	10,868		
Kuwait	2,005	1,830	3,877	4,487	
United Arab Emirates	3,912	3,682			
Africa					
Egypt			31,252	64,431	89,602
Morocco		20,977	70,464	82,615	68,713
S.African Customs Union	48,456	59,842	41,368	66,740	
Algeria	13,388	18,137	23,131	35,147	
Tunisia	2,834	3,491	4,849	10,058	8,919
Zimbabwe	37,378	8,322	3,627	5,711	
Mozambique			1,660		
Mauritius	708	1,235	1,203	1,198	
Total	*10,339,721*	*9,750,950*	*12,012,182*	*12,496,423*	*12,101,916*

* Soft oil seeds include groundnuts, sunflower, sesame and cottonseed.

Source: ITC, 1999.

quire large quantities of land. With increasing land pressure and costs of producing traditional crops, mushrooms offer an attractive alternative to smallholder farmers. The market potential exists, both locally and internationally.

Table 15 shows the EC imports of processed and dried mushrooms by country between 1988 and 1992. In 1992, Germany was the largest importer with an estimated quantity of 1,615 tonnes, followed by Italy (1,254 tonnes), France (963 tonnes) and the UK (554 tonnes). Although Germany imported the largest quantity of mushrooms, the value (ECU 19.12 million) was less than that of Italy (ECU 28.1 million), indicating a price and premium differential between the two. The statistics in table 15 show an increasing trend in levels of imports and therefore increasing opportunity for countries such as Malawi.

Table 15

EC imports of processed/dried mushrooms by country

	1988		*1989*		*1990*		*1991*		*1992*	
	Quantity Mt	*Value ECU '000*	*Quantity Mt*	*Value ECU '000*	*Quantity Mt*	*Value ECU '000*	*Quantity Mt*	*Value ECU '000*	*Quantity Mt*	*Value ECU '000*
Italy	1,175	36,572	1,351	50,275	1,040	33,354	1,296	39,207	1,254	28,056
Germany	1,141	15,693	1,218	16,890	1,529	19,414	1,534	18,769	1,615	19,150
France	819	15,627	855	17,309	872	15,969	967	18,069	963	17,193
United Kingdom	263	2,998	227	3,422	283	3,931	410	3,379	554	3,532
Netherlands	147	2,082	184	2,532	232	2,940	249	3,024	187	2,960
Spain	37	554	91	1,402	71	1,375	116	1,655	233	1,737
Belgium	49	500	41	742	68	960	58	910	79	728
Denmark	11	186	13	262	17	231	27	338	17	192
Ireland	49	249	20	154	35	267	21	190	22	176
Greece	3	38	4	70	5	66	7	66	9	75
Portugal	2	57	4	76	8	91	3	100	1	33
Total	3,696	74,556	4,008	93,134	4,160	78,598	4,688	85,707	4,934	73,832

Source: ITC, "Market Briefs 1993", cited in Banda, G. C., and K. V. Chigwenembe, "Development of Mushroom Production Village at Bvumbwe in Thyolo District", Malawi Export Promotion Council, 1994.

1.5.8. Organically-Grown Commodities

Changes in taste and preference are increasingly making organically-grown food and beverage commodities attractive, both domestically and internationally. This is due to increasing awareness of the health hazards and environmental damage associated with food and beverage commodities produced through conventional means. Fruits and vegetables that follow stringent international organic production and marketing specifications are sold at premiums relative to similar commodities grown under various regimes of inorganic fertilizer and agro-chemicals. The market is growing rapidly with an estimated trade value of US$ 11 billion and is expected to grow by 40 per cent within the next five years. There are over 100 countries engaged in organic farming, of which 65 are developing countries and 15 are least developed countries.

Organic farming is a recent development in Malawi. The Shire Valley Organic Growers Association (SHOGA) has been formed to develop and promote the concept and culture of organic farming. Currently, there are 20 members,

most of whom have adequate access to land and capital. Due to high cost of inspection and quality control, which most often requires expertise from Europe, this type of farming is beyond the reach of resource-poor farmers, most of whom have less than 0.2 ha land size. In addition to high inspection costs, often a minimum land holding size of 10 ha is required before a farmer can qualify to participate in organic farming in the country.

1.5.9. Horticulture

Domestic urban demand for fresh fruits and vegetables is estimated at 16,000 tonnes and 22,000 tonnes per year respectively, with an average per capita consumption of 9-12kg (GTZ, 1995). A study by the Horticultural Export Development Club indicates that several horticultural products are in high demand in European markets, particularly Germany, the United Kingdom, France and the Netherlands. These commodities include okra, beans, mangetout, chilies, baby corn, sweet corn, asparagus, garlic, courgettes, aubergines (eggplant), sweet pepper, ginger, cherry tomato and mixed herbs. Although the production level of fruits and vegetables is inadequate, estimates by the ITC indicate that the country exports these commodities. In 1994 and 1995, export revenues from fruits and nuts were estimated at $1.3 million and $2.5 million respectively. The values of vegetables exported during the same years were $3.4 million and $8.2 million respectively. Although Malawi is able to export, it also imports certain fruits and vegetables to supplement local supplies. In a number of cases, imports and exports of these commodities involve informal cross-border trade and are unrecorded such that the true magnitude of transactions is grossly underestimated.

A large share of vegetables is grown in wetlands or riverbeds (dambos). Development of simple as well as advanced irrigation facilities is one way to expand the production base of these commodities. Table 16 shows the performance of several horticultural products with the use of treadle irrigation pumps. Gross margins per hectare are generally extremely high and the responses to high levels of management are particularly impressive.

Table 16

Gross margins for selected horticultural products under treadle pump irrigation

	Gross margin/ha (k/ha)		*Return/unit variable cost (per cent)*	
	Medium management	*High level management*	*Medium management*	*High level management*
Tomato	66,973.2	226,254.0	4.4	10.5
Cabbage	35,997.2	71,997.2	5.5	10.0
Lettuce	17,372.4	32,984.8	3.6	5.7
Cauliflower	69,592.4	118,317.2	13.9	18.7
Onion	33,047.2	103,047.2	2.9	7.1
Snap bean	13,243.6	29,243.6	2.2	3.7
Green pea	39,164.9	85,660.5	4.6	7.0
Leaf mustard	43,084.8	71,422.0	7.2	9.3
Green maize	20,659.9	35,659.9	5.8	9.2
Irish potato	28,360.8	68,360.8	2.3	4.2
Chinese cabbage	22,584.8	45,584.8	4.0	6.4
Cucumber	53,843.7	97,843.7	9.7	14.7
Carrot	29,123.6	59,123.6	2.8	4.7
Okra	8,923.6	44,923.6	1.6	4.4
Sweet potato	35,000.0	110,000.0	3.3	8.3
Egg plant	43,192.4	135,192.4	10.0	29.1
Sweet pepper	26,623.6	66,623.6	6.0	13.4
Ginger	36,925.4	106,925.0	1.9	3.5
Broccoli	54,592.4	117,542.0	11.1	16.8
Turmeric	46,076.7	179,201.5	2.0	4.9
Pumpkin	42,288.7	98,322.3	8.4	15.7
Garlic	5,547.2	25,547.2	1.6	3.7
Shallot	16,047.2	52,047.2	3.0	7.5

Source: Ministry of Agriculture and Irrigation, "Mechanisms for Privatization of Treadle Pumps", 1998.

Tomatoes, turmeric, egg plants, cauliflower, broccoli, sweet potatoes, and onions, with gross margins per hectare of K226,254, K179,202, K135,192, K118,317, K117,542, K110,000, and K103,047, respectively, achieved the top most positions with high levels of management, while cauliflower (K69,592), tomatoes (K66,973), broccoli (K54,592), cucumber (K53,844), turmeric (K46,076), egg plants (K43,192), leaf mustard (K43,084.80) and pumpkin (K42,289) were the most profitable horticultural crops at the medium level of management.

Returns per unit of variable cost were also highest with eggplants, cauliflower, broccoli, pumpkin, cucumber and sweet pepper at high levels of management, whereas those of cauliflower, broccoli, eggplants, cucumber, leaf mustard and sweet pepper were highest at medium levels of management. Although the returns per unit area are quite high relative to tobacco, production is low, scattered and uncoordinated, resulting in the country's failure to meet both local and international demand.

1.5.10. Cut Flowers

Cut flowers have been identified as one of the high value products with excellent export potential. According to Banda and Mndalasini (1996), there are three main producers of this commodity in Malawi, namely Lingadzi, Zikomo and Tropex. The first two producers are located in Lilongwe, whereas the last producer is in Mangochi. Since this study was completed a number of producers have entered the market. However, their number and size of operation has yet to be determined although according to Chikaonda (1999) the current area under production is estimated at 20 ha. Chikaonda, further estimates that the current production level yields K3 million to K4 million of foreign earnings. If this estimate were realistic, Malawi could drastically reduce dependence on tobacco as the major source of foreign exchange by a slight increase in the area under cut flowers cultivation.

The major outlet for the country's cut flowers is the Netherlands. However, the major importers of this product include the United Kingdom, France, Germany, Canada and Switzerland. The capacity to substitute cut flowers for tobacco is limited by the high cost of handling, storage and airfreight.

1.5.11. Livestock

Domestic market opportunities for livestock products exist. A study undertaken by the Ministry of Agriculture and Irrigation for the year 1997 (table 17) indicates that Malawi imported 13,000 tonnes of milk (38 per cent of consumption), 1,430 tonnes of eggs (15 per cent of consumption), 900 tonnes of poultry meat (7 per cent of consumption) and 500 tonnes of red meat (1 per cent of consumption).

Table 17

Local consumption of livestock products, 1997

	Domestic supply		*Imports*		*Total consumption*	
	(tonnes)	*(per cent)*	*(tonnes)*	*(per cent)*	*(tonnes)*	*(per cent)*
Red meat	44,916	98.9	500	1.1	45,416	100
Poultry meat	11,485	92.7	900	7.3	12,385	100
Total meat	56,401	97.6	1,400	2.6	57,801	100
Milk[1]	21,120	61.9	13,000	38.1	34,120	100
Eggs[2]	8,183	85.1	1,430	14.9	9,613	100

1. Estimated raw milk equivalent to imported milk products
2. Eggs assumed to be 38 grams from village poultry and 50-59 grams from commercial poultry.

Source: Ministry of Agriculture and Irrigation, "National Livestock Development Master Plan, Draft Final Report",1998.

It is estimated that the country will need to import 24,464 tonnes of milk (54 per cent of consumption) 5,347 tonnes of poultry meat (30 per cent of consumption), 3,080 tonnes of eggs (24 per cent of consumption) and 4,982 tonnes of red meat (8 per cent of consumption) by the year 2010, under the current level of production (see table 18). These statistics justify the strengthening and expansion of livestock production for local consumption in order to save foreign exchange.

Table 18

Demand and supply balance of livestock products in 2010 – Baseline

	Total consumption (tonnes)	*Domestic production (tonnes)*	*Supply and demand gap (tonnes)*	*Gap as a percentage of consumption*
Red Meat	60,676	55,694	4,982	8
Poultry Meat	18,012	12,665	5,347	30
Milk	45,584	21,120	24,464	54
Eggs	12,843	9,763	3,080	24

Source: Ministry of Agriculture and Irrigation, "National Livestock Development Master Plan, Draft Final Report",1998.

The market outlook for the commodities discussed in this section indicates potential trade opportunities which could have been captured by Malawi had the strategies for diversification been developed and implemented earlier. The following section discusses some constraints that have limited the country's capacity to exploit these opportunities.

1.6. Constraints to Diversification

Although a number of studies have made recommendations on potential areas for diversification, the response from farmers and potential investors has been weak, due to a number of constraints, some of which are internal and others are external. Among the internal factors are the lack of a policy framework and strategy for implementation, poor dissemination of technical and economic information on potential commodities, the lack of financial support to potential investors, inadequate value-adding activities, and poor infrastructure. External factors include tariff and non-tariff barriers, weather, high cost of transportation and competition at regional and international levels.

1.6.1. Internal Factors

1.6.1.1. Policy

Trade policies, both domestic and foreign, tend to affect the level of diversification. If the domestic and foreign policies are conducive, more traders will be encouraged to go into business, thereby creating more demand for the products emanating from diversification followed by increased household income. While diversification has for a long time been on Malawi's development agenda, there has never been a serious attempt to develop a strategic plan, on which diversification could be implemented. Policy documents simply state the need to diversify, without providing details regarding the means and mechanisms for diversification. For example, the growing of soyabeans was promoted in the early 1990s among smallholder farmers without parallel development of agro-processing and utilization technologies. This meant that all the produce was destined for foreign market outlets. With unfavourable terms of trade, most farmers abandoned the crop in favour of alternatives such as burley tobacco. The Ministry of Agriculture and Irrigation has also encouraged the growing of paprika in spite of the absence of a guaranteed market outlet. The existing local market is characterized

by a near-monopsony structure, which offers farmers limited scope for income generation. Lack of export financing for private traders engaged in the export of this commodity further limited the country's capacity to diversify beyond traditional commodities.

Currency devaluations have often been considered necessary to improve the country's competitiveness and balance of payments position. However, recent devaluations have tended to be reactive rather than proactive, resulting in disruption of business transactions and escalation of prices of imported inputs. The rising costs of inputs relative to producer prices have thus reduced farmers' ability to expand their production capacity as well as engage in new activities.

Although the Government finds it necessary to collect levies and taxes on certain commodities, high levels reduce the rate of return on investment and therefore tend to discourage farmers from engaging in productive ventures. Other revenue generating activities, such as licenses and import duties, work against diversification. For example, the cost of animal feed is exorbitant, partly due to tariffs imposed on essential ingredients of feed mixes, as can be seen in table 19. With the exception of wheat and maize, all other ingredients attract different levels of custom duties. Surtax is also imposed on soyabean meal, oil cakes and fishmeal.

Table 19

Surtax rates on imports of livestock feeds and feed ingredients

	Custom duty COMESA (per cent)	*Custom duty MFN countries (per cent)*	*Surtax rate (per cent)*
Wheat and Maize	0	0	Exempt
Sorghum	Free	20	0
Soyabean meal	6	10	20
Meals, Pellets etc	Free	35	Exempt
Oil cakes	6	10	20
Fish meal	5	35	20

Source: Customs and Excise (Tariffs Order 1996 and Public Notice No. 9/1998) cited in the Ministry of Agriculture and Irrigation, "National Livestock Development Master Plan, Draft Final Report", 1998.

1.6.1.2. Weak Institutional Infrastructure

The role of relevant institutions, such as the Ministry of Commerce and Industry, the Malawi Chamber of Commerce and Industry, the Malawi Export Promotion Council (MEPEC) and the Malawi Investment Promotion Agency (MIPA), includes identification and development of domestic and foreign markets, facilitating trade between domestic and foreign investors (through trade fares and other exhibits) and information dissemination. Although these organizations have been in existence for quite a while, they have lacked capacity to influence change in the structure of agricultural production in and exports from the country. Some of these agencies have almost failed to identify commodities that are comparable to tobacco in terms of employment and foreign exchange generation and have also not adequately identified and publicized niche markets for potential substitutes to tobacco.

1.6.1.3. Bias in Research, Technology Development and Transfer

A major flaw in the process of diversification has been the bias of research activities and technology development in favour of tobacco and maize. This has tended to marginalize potential substitutes for tobacco in terms of cash income generation and food security. Unlike technology development and transfer in tobacco, any information available through extension and training services on potential alternatives has not been in a form that is readily usable and understandable, especially among smallholder farmers, most of whom are illiterate. Knowledge gained, based on appropriate information, contributes to the level of under-

standing on the concept of diversification. In addition to this lack of knowledge, there has not been a vigorous campaign to promote the production of promising commodities for diversification. Again this is due to policy bias in favour of the two major crops (tobacco and maize).

1.6.1.4. Poor Access to Resources.

Lack of access to resources, such as land, labour and capital especially among smallholder farmers, has limited the capacity to engage in enterprises that would compete favourably with tobacco.

Land

Land holding size determines the type and capacity of enterprises. Most smallholder farmers have less than 0.2 ha of land, which is inadequate for the production of both cash and food crops under the present level of technology and management. In the case of beef and dairy farming, the size of land for grazing is a major limiting factor. For example, the possibilities for large-scale beef and dairy production in the Southern Region are almost nonexistent unless radical changes in the distribution of land are undertaken. Although cattle production is possible in the Central and Northern Regions, low crop productivity limits the available land and the capacity to diversify. Land tenure is another constraint preventing increased investment on customary land. The absence of property rights encourages land fragmentation and discourages its economic utilization.

Labour

The level of diversification also depends on the availability of labour, especially among resource-poor households. Adoption of new technologies is usually associated with increased scale of activities and output requiring additional supply of labour. This is mainly true during peak labour periods, such as planting, weeding and harvesting. The problem of labour supply is further exacerbated by conflicting demands for time allocation between fieldwork and piecework (ganyu), as a copping strategy for vulnerable households. Labour demand for the two activities often coincide with each other

Capital

Poverty is one of the major contributing factors to lack of capital among smallholder farmers. The few financial institutions that provide agricultural loans to farmers have in practice not extended their facilities to non-tobacco activities. Recent estimates suggest that 70 per cent of the smallholder community is outside the credit system. Since they have to find their own means of acquiring agricultural inputs, their capacity to diversify is extremely limited. The problem of access to credit is even worse among women-headed households, mostly due to gender bias by the financial institutions.

1.6.1.5. Poor Road Infrastructure and High Cost of Transportation

While poor road infrastructure and high cost of haulage for Malawi's cargo reduce net benefits to traders, they also influence prices paid to primary producers. For example, road transport from Beira to Lilongwe is a major cost item for fertilizers, equivalent to 14.5 per cent of the retail price (Resal 1999). Adding up the cost of inward road transport, and clearing and bank charges gives an estimated cost delivered to a Lilongwe warehouse of some US$ 221 per tonne, rep-

resenting 58 per cent of the present retail price of fertilizers. Nacala is the closest port to Malawi, being only some 600 km from the border. When compared with other rail rates in the region, the Nacala route is relatively expensive. For example, whereas the tariff from Nacala to Blantyre is equivalent to US$ 0.066 per tonne/km, the rail tariff from Beira to Harare is only US$0.046 per tonne/km (Resal).

Apart from the poorly developed road network, the production structure itself, which is fragmented, inherently raises the cost of transfer from the farmgate to points of sale or consumption. In addition, some of the roads linking the rural production areas and the urban consuming centres are seasonal and create irregularities between supply and demand.

1.6.1.6. Societal Values

Societal values are important in determining the type and extent of diversification. Some enterprises can hardly be accepted in certain societies, even if their returns are high. For example, introduction of piggery in Moslem dominated areas will be unacceptable.

1.6.2. External Factors

Trade policies in foreign countries tend to affect the level of diversification. These include tariff and non-tariff barriers, price supports and subsidies as well as bilateral and multilateral conventions. The environment is another major external factor.

1.6.2.1. Tariffs

Although tariffs are gradually being phased out through market liberalization, the pace is not uniform between nations. For example, while Malawi's textile exports to Zimbabwe are subject to duty, imports from Zimbabwe have entered Malawi duty free (Donovan and Chigaru 1996). Donovan and Chigaru have observed that the volume of imports from Zimbabwe rose from K72.7 million in 1990 to K901 million in 1993, whereas Malawi's exports to Zimbabwe fell from K17.6 million to K6.7 million during the same period. Tariff escalation appears to be associated with value adding. The higher the value added, the higher the tariff. Since value adding is an integral component of diversification, the rise in the tariff rate is a deterrent to expansion of the export base.

With trade liberalization, the Generalized Scheme of Preferences (GSP) and the Lomé Convention preferences accorded to Malawi and other African, Caribbean and Pacific (ACP) nations will gradually be eroded, exposing the country to vagaries of international market forces. Under the Lomé Convention, Malawi's tobacco enters the European Union duty free unless imports cause or threaten to cause injury to the EU economy, in which case safeguards may be invoked. Unless high levels of production efficiency are achieved, international competition complicates diversification.

1.6.2.2. Non-Tariff Barriers (NTBs)

Non-Tariff Barriers (NTBs) take a variety of forms, including quotas, restricted market access, licensing, phytosanitary requirements, quality control, price supports and subsidies. Except for price supports and subsidies, NTBs can and do

selectively restrict access to foreign markets and limit developing countries prospects for diversification. Price supports in developed countries encourage overproduction, which in turn exerts a downward pressure on world market prices. Developing countries, such as Malawi, whose farmers are not equally protected from such practices, tend to loose in terms of foreign earnings.

1.6.2.3. Competition Among Producers of Similar Commodities

Countries with similar production structure tend to hinder each other's capacity to diversify. A case in point is the production of burley and flue-cured tobacco in Malawi, Mozambique, Tanzania, Zambia and Zimbabwe. This is in spite of availability of information suggesting commodities that are best suited to each country, based on comparative advantage (see Abalu, Mucavere, Ng'ong'ola, Van Rooyen, Kirsten, Van Zyl, Saasa, Simbi, Sithole and Vink 1996). Apart from underutilizing regional capacity, these countries are virtually producing for the same market, thereby creating an excess supply situation and unattractive return to investment.

1.6.2.4. Natural Environmental Factors

Finally, natural environmental factors, which include rainfall, temperature, soil type and altitude, also affect diversification. For a given location, these together will tend to favour specific enterprises. For example, tea is only grown in Malawi in areas with high rainfall, low temperature, and high altitude in Thyolo, Mulanje and Nkhata-Bay districts. However, these factors are outside the control of farmers. Improved technology, coupled with good management, could minimize the vagaries of poor environmental conditions and still achieve economic returns to investment.

1.7. Conclusions

The objective of this chapter was to assess potential agricultural alternatives to the production and export marketing of tobacco in Malawi through a literature survey and in-depth interviews of selected stakeholder. Specifically, the chapter aimed at:

- identifying market opportunities for new and processed products that are alternatives to tobacco production; and
- determining factors that have led to lack of implementation of recommended options.

Seven other major studies, dealing directly with the diversification issue, have been reviewed in this chapter (the World Bank, Nakhumwa, Keyser, Jafffe, LUSO Consult, Jansen and Hayes and the International Trade Centre (ITC)). In the majority of cases, Gross Margin Analysis and Domestic Resource Cost Ratio (DRC) from the Policy Matrix Analysis (PAM) were used as criteria for identifying alternative commodities to tobacco. Although the studies span different time periods and differ on scope of commodity coverage, their conclusions are similar. In particular, Malawi has no comparative advantage in maize production and this crop should only be grown as an import substitute to save foreign exchange. The other conclusion from the studies is that the country should diversify out of tobacco and concentrate on commodities which are of high value but less bulky, such as spices, oil seeds, some horticultural crops, cotton,

pulses and mushrooms. Although there is convergence and unanimity on the findings, recent changes in the terms of trade following market liberalization have altered the comparative advantage and priority among them. For example, although the country is said to have no comparative advantage in maize production, the recent price increases have made production of hybrid maize competitive domestically. In the initial analysis, chilies had low comparative advantage, but it now appears that the competitiveness of this crop has improved. This therefore implies that there is a need to regularly revise all indicators of profitability, in order to conclusively identify alternatives to tobacco.

The use of Gross Margins and DRC ratios ignores multiple objectives associated with the choice of enterprises or enterprise combinations for farmers to engage. Jansen and Hayes have used a Multiple Objective Policy Analysis Matrix (MOPAM) to overcome this weakness. However, MOPAM scores also need to be updated to reflect changes in relative profitability among competing enterprises. Gross Margin and DRC-based indicators alone are inadequate in measuring opportunity cost between enterprises. Thus, apart from reviewing these indicators in further research, additional economic indicators using GOAL Programming and Benefit/Cost analysis should be incorporated.

Although farmers are aware of the changing comparative advantage between competing enterprises, the magnitude of these changes is not known with certainty. Apart from a host of constraints, some of which are within their control and others are not, lack of information on the magnitude of relative profitability partly explains the low speed with which farmers are engaging in alternative enterprises to tobacco. In general, the major constraints to diversification include lack of a policy framework and strategy for implementation, poor dissemination of technical and economic information on potential commodities, lack of financial support to potential investors, inadequate value-adding activities, poor infrastructure, tariff and non-tariff barriers, poor environment, high cost of transportation and competition both at regional and international levels. Chapter II addresses these issues and Chapter III lists the recommendations of an Expert Workshop on how to deal with them.

CHAPTER II

ANALYSIS AND PROPOSALS FOR FUTURE DIRECTIONS

2.1. Background

Following the review and synthesis of literature in chapter I on the development of agricultural alternatives to tobacco production and exports, further analysis was undertaken to develop guidelines and strategies for agricultural diversification in Malawi. The process involved a revaluation of the country's comparative advantage in a selection of commodities, based on Domestic Resource Cost (DRC) ratios, Multiple Objective Policy Analysis Matrix (MOPAM) scores and financial indicators of gross margins and benefit/cost ratios. These indicators provided a basis for identifying potential alternatives to tobacco. Based on the constraints to diversification discussed in chapter I, strategies and action plans have been proposed and recommendations were made by an Expert Workshop held in Blantyre, Malawi (21-22 July 1999).

2.2. Review of Comparative Advantage

Sections 1.3. and 1.4. of chapter I provide a conceptual and methodological framework for analyzing prospects for diversification. The use of DRC ratios, gross margins, MOPAM scores and indicators of growth potential, competitiveness and positioning in relation to trading partners' imports were outlined. Commodities considered in the literature constitute those produced by the farming systems currently practiced in the country.

Evaluations of the country's diversification potential by various authors using DRC, gross margins and MOPAM were also provided in chapter I. For example, among smallholder enterprises, 47 out of 54 commodities had DRC coefficients of less than 0.5. These crops included burley tobacco sold through the auction floors, Northern Division Dark Fired Tobacco (NDDF), cotton, groundnuts and soyabeans. Horticultural crops such as onions, tomatoes and cabbage were also included in this category. Among estate activities, 43 commodities had DRC scores of less than one and 34 had DRC coefficients of less than 0.5.

From the literature reviewed in chapter I, commodity ranking based on both MOPAM and DRC placed beans, tobacco, confectionery groundnuts, sorghum, onions and potatoes highest on the list of potential activities, while broiler chickens, goats, beef (stall-feeding) and chilies were lowest. Among legumes, guar beans, pigeon peas (lentils), phaseolus beans and groundnuts ranked highest. Growing of phaseolus beans was rated highest in terms of return per hectare and MOPAM among all activities. However, changes in the economic environment following market liberalization have necessitated the reevaluation of DRC and MOPAM scores and financial indicators. In addition, benefit/cost indicators have been computed to complement efficiency criteria for commodity selection.

The benefit/cost indicator is a ratio between discounted benefits and costs for a commodity and the following is a standard formula:

$$B/C = \frac{\sum_{t} \left[\frac{p_i q_i}{(1+R)^t} \right]}{\sum_{1} \left[\frac{r_i x_i}{(1+R)^t} \right]}$$

where p_i and q_i are commodity price and quantity for commodity *i*, r_i and x_i are factor price and quantity for the same commodity *i*, R is the annual discount rate and t is the time period. However, due to variations in enterprise duration, the formula is modified using monthly interest rates and duration of the growing period to discount revenue and costs, thus facilitating comparison between short, medium and long duration enterprises. The benefit/cost ratio is equal to 1 when discounted benefits and costs are equal, and greater than 1 when the former exceeds the latter. High B/C ratios imply greater efficiency in resource utilization.

A total of 36 commodities has been considered in this exercise. This is less than the number of commodities considered in some of the earlier studies appearing in chapter 1 of the study. Lack of data and a time constraint necessitated the reduction in the commodity set.

As indicated in table 20, factors considered in the MOPAM analysis included drought tolerance, price variability, income generation, food security, employment and diversification potential. MOPAM uses weighted scores to select commodities for diversification. Each factor is assigned a weight and score, depending on the importance of that factor for the commodity under consideration.

Table 20

Format for Multiple Objective Policy Analysis Matrix (MOPAM)

Multiple-Objective Indicator	*Weight*
1. Drought tolerance	1.5
2. Price variability	0.5
3. Income generation	4
4. Food security	2
5. Employment	1
6. Diversification potential	1
Totals	10

For convenience and ease of computation, 5 is the highest score that can be assigned to a given factor while 1 is the lowest. Weights add up to 10 and they can be distributed according to the individual rating of the factor. For example, if income generation is considered the most important factor in commodity selection, it could be assigned a weight of 4 out of 10 and, if tobacco contributes the most to income generation, it could be assigned a score of 5. Thus, the weighted score of tobacco would be 20. Although this approach appears subjective at the level of an individual, choice of weights and scores by a heterogenous group of say 10 stakeholders compensates for an individual's subjectivity. In this exercise, a group of 5, comprising two consultants and 3 randomly selected stakeholders, was used to derive weights and scores for the 36 commodities and respective factors.

A major weakness of this MOPAM, however, was that it did not include the effects of diversification on the natural environment. This was not possible because of a time constraint. An attempt to correct for this weakness was made by a Task Force on Diversification after presentation of chapter II at the Second Expert Workshop (21-22 July 1999). Apart from including environmental concerns in the commodity selection criteria, the Task Force also considered technological availability as a constraint to diversification and the geographical production potential as an indicator of extent of beneficiary coverage.

While the scoring from 1 to 5 was maintained in the Task Force's exercise, the weighting for each factor was restricted to an upper limit of 1. Hence, the total weighted scores obtained by the Task Force are lower than those obtained from MOPAM scores derived by the consultants and 3 stakeholders in an earlier exercise. The need to focus on a limited range of potential commodities for diversification prompted the Task Force to consider only 10 commodities including beans, groundnuts, pigeon peas, soyabeans, millet/sorghum, cotton, rice and cassava. Although maize is an important food crop, it was not included, since it has received unequalled attention in terms of research and development programs compared with other commodities. Tobacco was left out for similar reasons and the need to diversify out of it.

Tables 3 to 8 in annex I provide revised PAM, financial and MOPAM indicators, which were estimated using 1999 price and production statistics. The five methods for identifying potential enterprises for diversification provided different rankings in terms of priority. This is expected due to differences in emphasis and choice of commodities and factors, especially with respect to the two MOPAM indicators. While the DRC ranking emphasizes export competitiveness among enterprises, the benefit/cost approach indicates enterprise feasibility with respect to discounted return to investment, given cost of capital as measured by commercial lending rates. The gross margin approach is a crude measure of profitability, given that it does not take into account fixed cost and depreciation of capital items. The two MOPAM procedures attempt to amalgamate a wide array of socioeconomic considerations and constraints including environment. The difference between the two MOPAM indicators mainly arises from the choice of commodities, and the composition of stakeholders involved in determining weights and scores of factors for the commodities.

According to the magnitude of the DRC estimates in annex table 3, Malawi has comparative advantage in all commodities considered for export (using export parity prices) except poultry (broilers and layers). Coffee followed by sorghum, paprika, inter-planted beans and maize, pure stand beans, soybeans, Irish potatoes, pigeon peas/maize and rice appear to have significant competitiveness in terms of export value.

As seen in annex table 4, when benefit/cost ratio is used as an indicator of diversification potential, the order of ranking does not significantly change the profile of commodities, except sorghum and macadamia which are placed highest and lowest, respectively. A long gestation period for macadamia probably accounts for the shift in the placement.

As shown in annex table 5, when gross margin is used as a criterion for diversification potential, estate flue-cured tobacco is placed highest in the commodity set, followed by estate coffee, green pepper, cabbage, Northern Division Dark Fired Tobacco (NDDF), estate and smallholder burley tobacco and paprika.

The MOPAM indicators in annex table 6 were weighted by the importance of price variability, income generation, food security, employment, potential for diversification and drought tolerance. They show macadamia ranked highest among all commodities, followed by estate coffee, cassava, Irish potatoes, estate tobacco (flue-cured), smallholder coffee, paprika and NDDF.

The MOPAM criteria developed by the Task Force are seen in annex table 7. Factors were drought tolerance, competitiveness (DRC), income generation, food security, employment, environment, production and technology. The

Task Force's MOPAM rankings placed cassava highest in priority, followed by beans, groundnuts, pigeon peas, soyabeans, millet/sorghum, cotton and rice.

As for the MOPAM criterion used for annex table 6, the Task Force's procedure suffers from inadequate commodity coverage. The narrow range of commodity coverage was caused by the need to prioritize. This limited commodity coverage makes difficult a comparison between different approaches, albeit not impossible.

The five approaches for commodity ranking are summarized in annex table 8. Overall, coffee, macadamia, cassava, beans, groundnuts, vegetables (cabbage, green pepper and tomato), millet/sorghum and rice appear to have the potential to compete with tobacco. However, geographical suitability and inadequate technology would limit the extent to which the majority of the rural masses would benefit from coffee and macadamia production. In addition, some of these commodities, such as cassava and horticultural crops, are bulky and highly perishable requiring improved methods of processing and storage to enhance value-added. Thus, their potential as alternatives to tobacco will largely depend on technology development geared towards value-adding. Although horticultural commodities score highly on the gross margin criterion, they perform poorly on efficiency (DRC and benefit/cost) and MOPAM largely because of poor management under smallholder regimes. There is room, however, to increase returns to investment in horticultural products by improving management practices such as selection of varieties, adoption of improved husbandry practices, handling, grading, packaging and presentation. All these require producers to be market-oriented in their planning and decision-making process.

Cotton is grown by a number of households along the low-lying areas. However, both the efficiency and financial indicators are poor relative to other commodities. The major factor contributing to this poor performance is the low price fetched by the commodity. Cotton price and its competitiveness can improve, if alternative niche markets are identified.

From this analysis, if resources were available to support the development of only seven major commodities from production, processing, to domestic and international marketing, these would include cassava, groundnuts, pigeon peas (lentils), soyabeans, millet/sorghum, cotton and rice.

2.3. Market Potential and Production for Alternatives to Tobacco

As discussed in chapter I, demand for commodities identified as potential alternatives to tobacco exists in Africa, Asia, the Middle East and Europe (see tables 10 to 18, except 16 in chapter I).

As seen in figure 3, while the growth in world demand for vegetables and rice is rising, demands for cereals and cotton appear to be static. This information provides evidence of opportunities that have been missed by Malawi over the past decade in terms of foreign exchange earnings, hence the need to reorient trade strategies.

As far as spices are concerned, as shown in figure 4, the share of pepper in world demand (35%) is the largest followed by capsicum (17%, which includes paprika, chilies and cayenne pepper), spices-seeds (17%), cinnamon and cassia

(9 %) and tumeric (6%). Although trade in spices, as compared with vegetables, cotton and rice in figure 3, is small, the sheer value of imports represents a large market (billions of US dollars), thus providing ample opportunity for entry by Malawi. However, this requires aggressive marketing and effective institutional support, an agenda for action by MEPC, MIPA, Trade Missions and the Ministry of Commerce and Industry.

Coffee has been identified as one of the most important alternatives to tobacco production and export. An examination of consumption statistics, based on imports shows, that there is a growing trend in world demand. Table 21 provides statistics on selected importing countries which are actual or potential trading partners for Malawi. Germany, France and Italy are the major consumers of coffee, with values of imports estimated at US$2.1 billion, US$1.1 billion and US$0.9 billion respectively in 1996. It can thus be argued that increased production of this commodity in Malawi would easily be absorbed by the world market. However, since Malawi does not have a long history of coffee production, it faces stiff competition in terms of quality from countries which have coffee as a long established industry. Quality assurance and steady supply are likely to attract and entice buyers to Malawi's product. The quality of the smallholder coffee in Mzuzu has already been appreciated, showing that the country has the potential to satisfy tastes and preferences of consumers in the world market. Identification of suitable agro-ecological zones, such as the Mzuzu catchment area, would therefore provide a basis for expanded coffee production. The Ministry of Agriculture and Irrigation, in liaison with the private sector, needs to examine this challenge and develop strategies for diversifying into this area.

Figure 3

World imports of selected commodities, 1992-1996

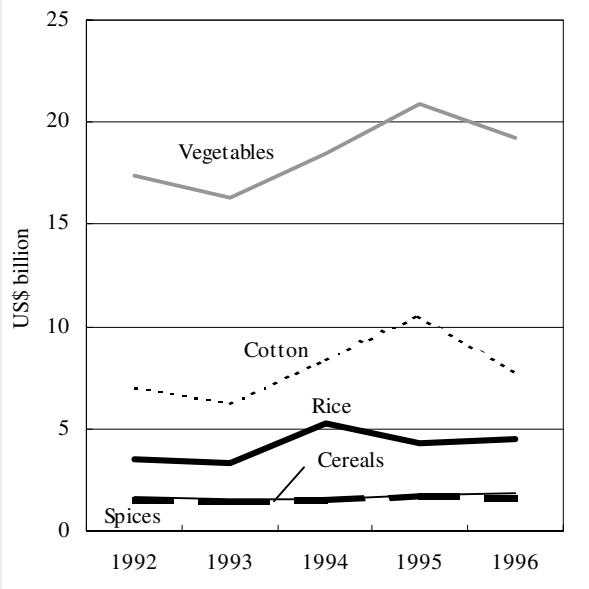
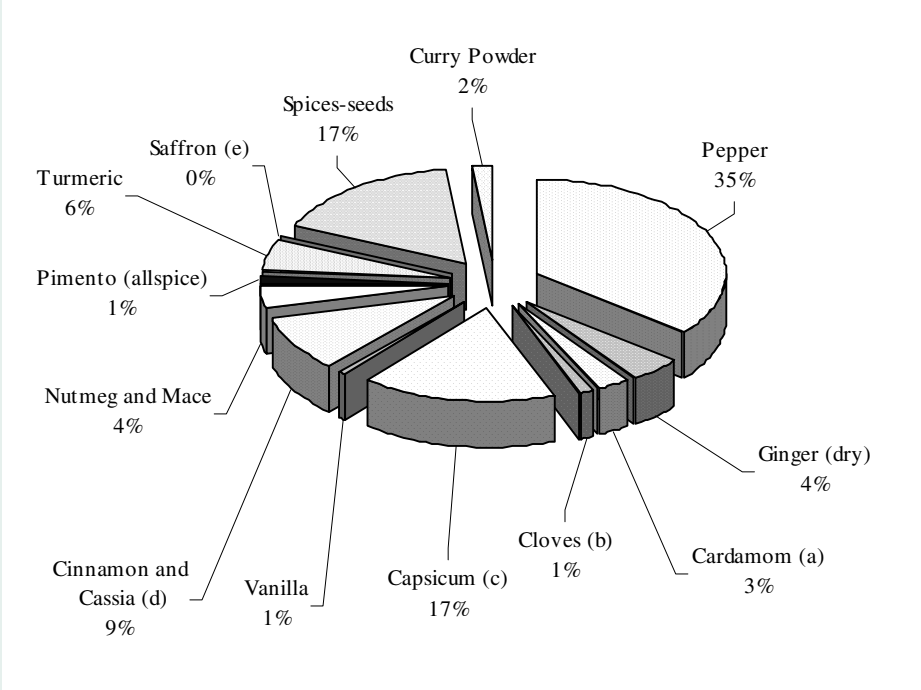


Figure 4

Estimated trade in individual spices, 1983-1987



(a) Excluding domestic consumption in India (approximately 3,000 tonnes).
(b) Excluding imports into Indonesia, Hong-Kong and Singapore.
(c) Includes trade in paprika, chilies and cayenne pepper.
(d) Cassia accounts for around 90 per cent.
(e) 50 Tonnes.

Tree-nuts and oilseeds have also been highly featured as potential alternatives to tobacco production. Estimates of world consumption have been presented in chapter I (see tables 13 and 14).

Although the private sector has demonstrated interest in tree-nut production, especially macadamia and cashew, its efforts have not been adequately supported by marketing policies. In some instances, for example on farms of Press Agriculture, tree-nut bushes have been neglected due to the poorly developed marketing system. Among smallholder farmers, land and capital constraints appear to be the major limiting factors to tree-nut production. This is further aggravated by the long gestation period for the bushes before they become productive.

Initiatives to diversify estate agriculture into oil seed production were undertaken in the mid-1970s with groundnuts being a commodity of choice. Lack of institutional support, however, discouraged the continuation of groundnut pro-

Table 21

Imports of coffee and coffee substitutes, 1992-1996

	1992 ('000 US$)	*1993 ('000 US$)*	*1994 ('000 US$)*	*1995 ('000 US$)*	*1996 ('000 US$)*
Germany	1,399,668	1,365,631	2,039,274	2,858,860	2,129,018
France	643,818	639,677	1,051,897	1,377,049	1,110,139
Italy	397,566	467,940	744,586	1,105,643	876,698
Netherlands	410,710	367,499	493,480	725,137	599,425
United Kingdom	367,559	380,315	608,585	679,671	542,134
Spain	265,756	252,106	443,951	652,718	513,077
Belgium-Luxembourg	249,788	281,805	421,736	610,713	427,974
Sweden	182,768	208,328	357,304	371,199	327,844
Australia	190,142	158,826	237,913	270,283	211,385
Switzerland	141,547	123,989	182,660	236,388	202,368
Finland	107,960	133,265	238,769	185,190	194,510
Denmark	101,399	97,390	169,031	192,089	170,026
Algeria	56,913	105,821	308,163	158,150	
Portugal	58,489	64,566	102,863	152,141	132,726
Greece	68,286	52,471	93,570	131,896	
Norway	76,092	72,239	142,205	150,067	126,054
Israel	39,367	40,972	64,620	101,398	84,051
S .African.customs.un	16,666	21,556	45,950	54,947	
Turkey	15,135	22,522	24,877	45,128	
Morocco		23,657	38,514	60,613	44,370
Ireland	22,850	18,506	28,141	30,568	33,227
Saudi Arabia	40,667	29,005	28,533		
Tunisia	8,888	7,169	17,295	30,023	20,779
Egypt			11,350	20,586	17,018
Jordan	8,272	4,292	7,510	14,899	
Oman	6,791	3,700	5,794	11,907	
Kuwait	6,291	5,020	5,907	9,859	
United Arab Emirates	10,307	9,079			
Qatar	1,653	1,026	1,573		
Central African Rep.		12	191	3,860	1,554
Mauritius	1,045	1,161	1,515	1,209	
Total	4,896,393	4,959,545	7,917,757	10,242,191	7,764,377

Source: UNSO/ITC Comtrade Database System.

duction by the estates. Although smallholder farmers have for a long time also been engaged in the production of oil seeds, poor pricing and marketing of the product appear to have eroded their interest in favour of burley tobacco. Similarly, the production of soyabeans and sunflowers has been limited by poor marketing strategies.

A way of overcoming these constraints is for farmers and associations to produce for a known market which is secured by some form of contractual arrangement with guaranteed quantities to be purchased and prices offered.

Alternatively, farmers may be contracted as clubs/associations and estates by agro-processors and direct exporters to grow defined quantities at prescribed prices. This could improve farmers' accessibility to high quality seed and other factor inputs, including capital, thereby enhancing their productive capacity. Wholesale and packing enterprises, such as Tambala Food Products among others, could also engage farmers in a similar manner to ensure a ready and guaranteed market outlet. Further scope in expanding the production of oil seeds lies in the development of small-scale oil-extracting industries, which have been in existence in the country, albeit of little prominence. By-products from these industries could also provide additional raw materials for the manufacture of animal feed.

Production of cut-flowers as an alternative to tobacco is a recent development in Malawi. World imports of cut-flowers are estimated at US $3.7 billion (1995), of which Europe as a whole, led by Germany (US $1.1 billion), is a major consumer (table 22).

As discussed in chapter I of the study, transportation (including airfreight) is the major constraint to expanding production. The problem of transportation became acute with the termination of operations by the Royal Dutch Airlines in Malawi. The gravity of the crisis has forced the main producer of roses, Lingadzi Flower Farm in Lilongwe, to close down. Malawian producers could reduce the cost of transportation, if production, marketing and airline services were coordinated and possibly integrated at regional level. This requires formation of national and regional institutions (through COMESA) to undertake coordination and integration of these activities.

Currently, the leading exporter of cut-flowers is the Netherlands. However, climatic differences between Europe and tropical countries such as Malawi provide an excellent opportunity to capture the market during the winter season in Europe.

Involvement of smallholder growers in cut-flower production is limited by capital, technology and skills. Considering that many lending organizations are these days more inclined to extend credit to farmer clubs and associations, the scope for smallholder producers to engage in this business exists. However, there is a need to develop an efficient domestic market through which demands of domestic and foreign buyers can be met.

Potential for expanding the capacity of horticultural production using organic production methods exists in the country. The Shire Highlands Organic Growers Association (SHOGA) has just introduced this type of farming in Malawi and it is encouraging smallholder farmers to participate as associations or clubs. However, the scope for smallholder farmers to engage in this new mode of farming is limited by poor access to capital and technology, and lack of skills. In

addition to transportation bottlenecks similar to those faced by the cut-flower producers, the certification process is very demanding and expensive, even at club or association level. Unless there is adequate institutional support to potential entrants, organic farming is a remote possibility as an alternative to tobacco growing by the smallholder sub-sector.

Agricultural production in general and the potential for diversification have been hampered by inadequate and untimely availability of quality seed. The common use of recycled seed often results in poor yields and quality. Although production of quality seed was identified quite early as one of the strategies to boost agricultural production, seed production has only been undertaken by a few large-scale producers concentrating mostly on tobacco and maize. In addition, the marketing and distribution of seed has for the past three decades been the monopoly of National Seed Company, ADMARC, and hardware and general dealers. Although in recent times the production and marketing of seed are open to the private sector including smallholder farmers' associations, the capacity is still inadequate largely due to inadequate capital, skills and technology. In fact, the capacity of smallholder associations is limited to the production of open-pollinated maize varieties (OPVs) and grain legumes. Since diversification implies production of a wide variety of commodities, shortage of seed is a serious constraint. It has recently taken the initiatives of donor agencies, especially the European Un-

Table 22

Imports of cut flowers, 1991-1995

	1991 (millions US$)	*1992 (millions US$)*	*1993 (millions US$)*	*1994 (millions US$)*	*1995 (millions US$)*
World imports	3,351.70	3,565.50	3,026.70	3,445.00	3,716.80
Germany	1,245.30	1,321.70	893.10	1,052.60	1,124.90
United Kingdom	305.60	319.40	275.40	322.80	360.00
France	337.80	319.80	243.00	267.50	358.90
Netherlands	185.30	244.30	222.40	261.60	310.40
Italy	134.00	133.70	134.50	122.60	118.90
Belgium	77.30	81.40	70.90	82.10	95.80
Denmark	37.00	38.50	40.00	46.10	63.00
Spain	35.10	41.20	28.20	26.50	29.80
Ireland	16.00	17.80	15.40	17.10	19.00
Finland	12.90	10.60	7.10	19.00	16.30
Portugal	2.50	4.30	5.10	5.40	6.10
Austria	82.90	84.60	78.60	85.90	na
Sweden	79.20	83.40	65.10	68.40	na
Greece	9.20	8.30	15.80	16.30	na
United States	403.50	436.80	469.10	517.40	622.80
Japan	143.80	127.60	157.50	191.50	216.10
Switzerland	141.20	139.60	132.60	147.40	168.70
Canada	36.80	40.20	44.30	47.40	49.60
Singapore	13.20	17.90	23.80	31.80	29.60
Norway	29.50	30.60	25.30	26.00	28.80
Hong Kong	na	21.80	21.30	21.80	23.80
Czech Republic	na	na	10.40	14.50	18.90
Slovenia	na	4.80	7.80	9.50	12.30
Poland	na	2.5	3.30	4.10	3.90

Source: UNSO/ITC Comtrade database System and ITC, "Cut Flowers. A Study of Major Markets", Geneva 1997.

ion (EU) and the United States Agency for International Development (USAID) and NGOs (Action Aid and CADECOM) to intervene in this area for the country to consider the problem as a priority in food security.

With the increase in land pressure, mushrooms offer an excellent opportunity to resource poor and the landless households of the rural communities. Currently production levels fail to meet domestic demand of 80 tonnes, as well as foreign demand. Demand for mushrooms in the European countries is estimated at approximately ECU 74 million. Although demand and simple technology for mushroom production exist, farmers have not had the opportunity to diversify into this commodity. One of the reasons for this enterprise is the poor technology transfer from research institutions. Lack of adoption has also been due to poor marketing arrangements for the commodity, both locally and internationally. Thus, there is a need to investigate effective technology transfer mechanisms and reliable market outlets.

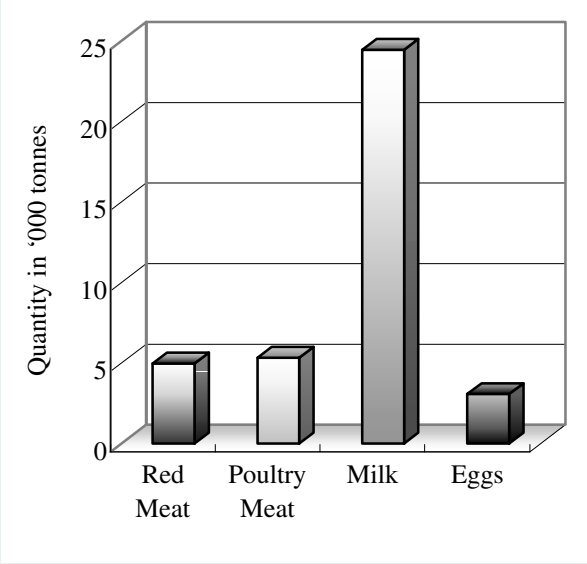
The need to improve quality and productivity of tea has been addressed in many government and donor community dossiers. However, the pace at which old low-yielding bushes are being replaced with clonal teas is rather slow, probably due to farmers' reluctance to uproot the bushes and the limited availability of seed stock. The willingness of tea growers to replace old bushes largely depended on their accessibility to STABEX funds, which were earmarked for this activity. Increased production of clonal planting materials by the Tea Research Foundation will also facilitate rapid replacement of old plantations.

Expanded participation of smallholder growers under the Smallholder Tea Authority is a way of diversifying the income base of the rural population in the densely populated areas of Thyolo and Mulanje. Identifying estate tea growers who are willing to sell or sublet their farms to the Tea Authority needs to be pursued. In the recent past, the marketing of smallholder tea has been a cause of concern, mainly due to pricing disputes. Some of these marketing problems originate from poor marketing strategies, which have led to stockpiling of processed tea in the country, resulting in loss of revenue and inadequate financing of marketing activities. Lack of market information and limited market outlets have probably contributed to an unsatisfactory pricing structure. Value-adding too has been inadequate to the extent that most of the tea sold by Malawi is used by foreign countries as blending material for flavoured teas.

The demand for livestock and dairy products in the country exceeds levels of supply, necessitating imports of these products to supplement local sources. Tables 17 and 18, in chapter I show current and future levels of supply and demand for livestock products in Malawi. These include red meat, poultry meat, milk and eggs. In 1997, Malawi imported 500 tonnes of red meat, 900 tonnes of poultry meat, 13,000 tonnes of milk and 1,430 tonnes of eggs to meet the gap between domestic demand and supply. Projections of shortages in the year 2010 are presented in figure 5.

Figure 5

Demand and supply gap of livestock products in 2010



Source: Ministry of Agriculture and Irrigation, "National livestock development master plan, Final report", 1998.

Poultry products, though currently having limited scope due to feed scarcity and cost, score fairly well in comparison with commodities which are highly competitive in terms of export earnings, as seen in annex table 4. This implies that the country should make concerted efforts to eliminate the feed constraint in order to become competitive at the regional level in the poultry industry. A way of overcoming this constraint is to develop low cost and smallholder farm-based feed sources through participatory research and extension. Apart from encouraging farmers to mix their own feed, local production of ingredients for feed, such as grain legumes, maize, fish meal, premixes and mineral supplements, should be expanded. Diversification of sources of supply for both feed and ingredients could also increase availability and reduce cost.

Shortages of red meat, poultry meat, milk and eggs are estimated at 4,982 tonnes, 5,347 tonnes, 24,464 tonne and 3,080 tonnes, respectively. These figures demonstrate the importance of developing an import-substituting livestock industry to save scarce foreign exchange. Improvement of the local herd through crossing with exotic breeds and artificial insemination was an integral part of livestock production strategies in the country. Malawi once had livestock breeding and improvement centres, for example Mikolongwe in Thyolo, Bwemba in Lilongwe and Kuti Ranch in Salima, but these are no longer functional or effective. Breeding and improvement centres that are still active, such as the Dzalanyama Ranch, are poorly managed. The closure of some of these centres and poor management of existing ones have limited the capacity to provide farmers with adequate stocks upon which they can expand livestock production in the country. The future of livestock development in the country therefore depends to a large extent on how the private sector gets involved and encouraged to invest in this industry. However, services, that were previously offered for free, such as animal health, need to be reestablished and provided to farmers association on a cost-recovery basis (user-fee). But research and regulatory functions need to be provided by government institutions.

The Department of Animal Health and Industry has already developed appropriate policies, strategies and action plans upon which the development of the animal industry in Malawi is to be based. There is, therefore, the urgent need to implement the recommendations of the National Livestock Master Plan in order to systematically integrate livestock activities in the nationwide diversification program.

Strategies being addressed by the National Livestock Master Plan include the development of mini-dairies, mini- and large hatcheries for the rural and semi-urban areas, improvement of feed and pastures, and the promotion of rearing of small animals such as poultry, sheep and goats. While the initiative to develop mini-dairies would lead to an increase in the production and consumption of milk, the production and processing capacities are limited by poor storage and road infrastructure between producers and processors. Inadequate feed and underdeveloped pastures are other major stumbling blocks to the sustainable development of the meat and dairy industries in Malawi. Under-sowing of legumes and improved grasses in dambos (small shallow valleys) and other rural grazing areas, through participatory community programs, would create a favourable environment for the production of a variety of animals. The planting of multipurpose trees such as lucaena and sesbania would simultaneously contribute to livestock development, soil fertility and sustainable management of natural resources and the environment. Due to the limitation of land size, intensive management of beef and dairy production, using the cut and carry system of feeding, needs to be reintroduced.

The major component of sugar production is undertaken by three major estates in Nkhota-kota and Chikwawa. Involvement of smallholder communities through the Smallholder Sugar Authority and out-grower schemes have the potential of diverting farmers' interest away from tobacco growing. Expansion of these programs to villages is, however, limited by fragmented and scattered land holdings, which are not amenable to mechanization. Since the potential to diversify into sugarcane growing among smallholder farmers exists, there is a need to identify contiguous pieces of land for such undertakings and to develop the culture of associations.

Agricultural production, especially that of maize, cassava and livestock, is becoming increasingly very risky due to rampant thefts. A community-based security system is one way of dealing with this problem. However, the ultimate responsibility for ensuring law and order rests with the government.

2.4. Marketing Systems and Channels

With the exception of traditional commercial crops such as tobacco, tea, sugar, coffee, tree-nuts, maize and groundnuts, most agricultural commodities are traded using informal marketing systems where standards and measures are arbitrarily set. The markets may be located in the village, by the roadside or in formal produce markets in major towns and cities. Fresh produce such as fruits and vegetables are sometimes sold on tender or contractual basis to retail chain stores (such as the People's Trading Centre and Kandodo), colleges, schools, the Army, hospitals and hotels. Lack of storage and processing facilities often compel the majority of traders to dispose of their commodities as quickly as possible. The implications of unstandardized pricing and rapid disposal of produce are reduced return to investment and also seasonal and geographical imbalances between commodity supplies and demands. This is an area that needs urgent attention by policy makers to encourage entry into new business ventures and increased production of agricultural commodities.

For the major commercial crops which have established markets, the scope of trading has increased with the entry of private traders following market liberalization. However, their capacity is often limited by liquidity constraints, poor skills and transport bottlenecks resulting from poor road infrastructure. Lack of effective institutional support to ensure access to credit, information and sure markets reduces traders' opportunities to make profits.

Private traders face the risk of product deterioration, theft and price fluctuations resulting from sudden changes in the levels of product supplies and demands. Formation of traders' associations provides an avenue through which certain risks including price fluctuations can be overcome. Associations can also be used to secure loans and bargain for reductions in input prices and better prices for produce.

Except for the traditional commercial crops, all other crops do not have defined and reliable channels for both domestic and foreign markets. For example Cheetah Ltd. is the major outlet for paprika in the country. Being the prominent buyer, Cheetah sets price levels that it deems fit and there is no mechanism to check whether or not farmers are being exploited. The case of soyabean marketing is yet another example of an underdeveloped marketing system of trading. Since soya was introduced in the country, ADMARC has been the major buyer.

In the initial stages, a number of farmers grew the crop only to withdraw a few years later when the price was no longer remunerative. Other reasons for low price levels were the oversupply on the world market and lack of processing technologies to encourage local absorptive capacity.

Most animals slaughtered in the rural areas are often sold without adhering to formal methods of exchange, such as the use of weights and measures. Usually, little attention is paid to quality assurance in terms of methods of slaughter, handling, health inspection, display and packaging. For example, wrapping material may sometimes include plant leaves, recycled plastic and dirty used cement pockets, which pose a health hazard to customers. In contrast, meat sold in towns and cities either originates from the Cold Storage Company or butcheries that follow standard marketing practices. For some time, live animals especially cattle have been sold using the public auction system. In villages, animals are sold by direct bargaining and without resorting to weights and measures.

The implications of a poorly developed marketing system and channels include failure to synchronize supplies with demands, reduced revenues and increased risks of animal-borne diseases such as TB. If the country's diversification program is to succeed, it must be supported by effective and efficient marketing systems.

2.5. Assessment of Environmental and Health Requirements

2.5.1. Background

Recently, consumer awareness about environmental implications of agricultural production has increased to the extent that it has become a subject of debate among bilateral and multilateral trading partners. The environmental issue is important as regards legislation on public health and environmental protection. Apart from employing legislative machinery, market strategies (such as organic farming, use of eco-labels to distinguish between environmentally-friendly and non-environmentally-friendly products, and incentives to introduce certification and environmental management) are increasingly becoming major avenues to address these problems, especially in developed countries. According to the 1998 joint report by the UNCTD and the Société Générale de Surveillance S.A (SGS), the gamut of policy instruments in the field of environment is vast and is used in different ways in various countries. National or regional legislation in important markets, for which growers, processors and exporters must comply, include:

- maximum levels of chemical residues
- food additives
- mold
- sanitary and phytosanitary requirements (SPS)
- regulations on packaging waste
- property rights in plant material and genetic modification.

In principle, environmental and health concerns in agriculture include:

- how to achieve cleaner production practices;
- how to prevent damage to the environment;

- how to reduce occupational health hazards;
- how to achieve organic or bio-organic production; and
- how to meet sanitory and phytosanitory requirements in export markets?

International standards for quality and hygiene covering fresh and processed foods are monitored and regulated by the FAO/WHO CODEX Alimentarius, the International Organization for Standardization (ISO) and the WTO Agreement on SPS. For example, the ISO 14000 series contain standards on environmental management and eco-labelling.

2.5.2. The State of Environmental and Health Compliance in Malawi

Malawi has embraced provisions of the agreements made at the United Nations Conference on Environment and Development held in Rio de Janeiro in 1992, as evidenced by the development and implementation of the National Environment Policy in 1994. The main agencies for ensuring adherence to national and international environmental standards for agricultural produce include the Department of Environment, the Malawi Bureau of Standards, the Department of Animal Health and Industry, and the Department of Research and Technical Services. However, most of these agencies lack technical, human and financial resources to enforce rules and regulations governing environmental protection and natural resources management. These constraints limit the coverage of quality control to major export commodities such as tobacco, tea and sugar. Pre-shipment inspection for export commodities is provided by SGS and at cost, which is often unaffordable to small-scale firms. Increased informal and unofficial cross-border trade has exacerbated the problem of monitoring adherence to international standards.

Examples of failure to meet international environmental standards in Malawi abound. Buyers in the region and in Europe have expressed concern about high incidence of aflatoxin in groundnuts. The use of methyl di-bromide and ethyl-bromide in tobacco nurseries has recently been raised as an environmental hazard. At the moment, tobacco producers do not appear to have an environmentally-friendly substitute for these products. The growing of tobacco has also been responsible for wanton destruction of vegetative cover leading to land and soil degradation. Although a clause exists in the leased land tenure covenants, i.e. that 10 per cent of the total tobacco growing land should be planted with trees, it has been ignored by lessees, especially due to lack of monitoring and enforcement of the provision. Use of banned substances in the growing of vegetables is not monitored. Considering that horticultural products have been cited as potential commodities for diversification, failure to monitor the conditions under which they are produced could ruin Malawi's opportunities to penetrate major world markets.

Strengthening existing environmentally-friendly strategies of disease and pest control, such as integrated pest management, offers an opportunity to reduce dependence on agro-chemicals, thus ensuring a market for environmentally-friendly products. In addition, possibilities of expanding the area for the production of organic agricultural produce through the National Smallholder Farmers Association should be explored. Sharing of inspection and certification costs through the Association could enable small-scale farmers to undertake this lucrative and environmentally-friendly enterprise.

2.6. Trade Context in National, Regional and Global Markets

Implementation of structural adjustment policies, including currency devaluation, free floating of the Malawi Kwacha, elimination of input subsidies, repeal of the restrictive Special Crops Act and overall market liberalization, has created a favourable and conducive environment for agricultural diversification. Other instruments designed to improve the business environment include the cooperative development policy, the Competition and Fair Trading Act and development of a microfinance policy. The cooperative development policy provides for a framework for establishing and operating cooperatives in the country, whereas the Competition and Fair Trading Act creates a level playing field for all business enterprises by regulating and monitoring monopolies and concentration of economic power while protecting consumers at the same time. The proposed microfinance policy aims at creating vibrant microfinance institutions that are sensitive to the needs of their clients and national goals and objectives.

At the regional level, a number of instruments to improve trade relations among neighbouring countries exist. One of these is the "Protocol on Trade in the SADC Region", the objectives of which are:

- to further liberalize intra-regional trade in goods and services on the basis of fair, mutually equitable and beneficial trade arrangements, complemented by protocols in other areas;
- to ensure efficient production within SADC, reflecting the current domestic, cross-border and foreign investment;
- to contribute towards the improvement of the climate for domestic, cross-border and foreign investment;
- to enhance the economic development, diversification and industrialization in the region; and,
- to establish a free trade area in the SADC Region.

Apart from the SADC Region-specific instruments to promote trade among African countries, there is the Common Market for East and Southern Africa (COMESA) whose aims are similar to those stipulated in the SADC Trade Protocol, i.e., to eliminate trade barriers and create a common market among participating countries.

Since COMESA was established, Malawi has moved faster than its neighbours to reduce tariff rates. In spite of this move, Malawi appears to be importing more than it is exporting which translates into balance of payment problems. In recent times, the country's imports have included petty goods from the Far East and produce, such as tomatoes and onions, fruits and other horticultural products, meat and dairy products from neighbouring countries such as Tanzania and Zimbabwe. Poor negotiating strategies during bilateral and multilateral trade talks have contributed to the deteriorating terms of trade for the country. There is, therefore, the need to gather pertinent and current information on both formal and informal trade flows, as well as the neighbouring countries' trade strategies, to reverse the trend of events. The country's strength in penetrating regional and international markets depends to a large extent on its ability to add value to predominantly bulky and low value primary export products. Development of an efficient transport system and road infrastructure will also play a critical role in reducing haulage costs and ensuring high levels of profit.

At the international level, Malawi, like any other developing country, faces stiff competition resulting from forces of globalization. Although the country has been accorded Most-Favoured Nation (MFN) status by virtue of being a member of WTO and is a signatory to the ACP treaty, reduction in trade barriers and creation of free trade areas in North America and Europe pose a serious threat to Malawi's ability to penetrate international markets. Increasingly, consumers in Western countries have become more demanding in terms of product quality with respect to health and environmental sustainability. Thus, the use of agro-chemicals in the production process of agricultural commodities increases risks of environmental damage through spillovers into rivers and catchment areas. The positions of tobacco and cotton, which are major users of fertilizers and chemical respectively, need to be examined carefully in the diversification portfolio.

CHAPTER III

RECOMMENDATIONS ON AGRICULTURAL DIVERSIFICATION OUT OF TOBACCO PRODUCTION AND EXPORT MARKETING IN MALAWI

The following recommendations were agreed by the Second Expert Workshop held at Blantyre, Malawi, on 21-22 July 1999.

2.7.1 There should be a Task Force to develop a policy framework, enabling environment (act) strategies and a plan of action. The policy should provide a framework for engagement of all stakeholders, including government, NGOs, donors and the private sector in terms of areas of diversification. The Second Workshop nominated the following individuals to the membership of the Task Force.

Dr. A.S. Kumwenda (ARET)
Mr. F. Mbendela (Exporters Association)
Mr. F.E. Jumbe (Poultry Association)
Mr. R. Ngwira (NASFAM)
Mr. T.M. Shawa (MIPA)
Mr. G.E.C. Banda (MEPC)
Mrs. G. Kalinde (MoAI)
Mr. M. Makoko (UNDP)
Dr. C.S. Mataya (Consultant- Marketing Specialist)
Mr. E.W. Tsonga (Consultant- Production Specialist)

2.7.2 A productivity potential profile should be developed detailing land, ecological, suitability, and environmental aspects.
Responsible institutions: MOAI, MIPA, Bunda College and the Department of Environmental Affairs, with MoAI in the lead.

2.7.3 Institutional framework for marketing of agricultural produce should be reviewed and developed. This should include elements of value-adding, marketing and risk management strategies, including insurance and grain stock exchange. ADMARC was noted to have already implemented Grain Stock Exchange or barter deals.
Responsible institutions: MoAI, ADMARC and MEPC, with MoAI in the lead.

2.7.4 A participatory rural road improvement program should be developed to link production areas with input and produce markets.
Participating institutions: National Roads Authority, MoAI and the European Union, with the National Roads Authority in the lead.

2.7.5 A community-based agricultural security program should be developed to deal with problems of theft to property.
Responsible institutions: Ministry of Home Affairs and MoAI, with the former in the lead.

2.7.6 Community-based stable food crops storage programs should be launched to ensure food security at household and village levels.
Responsible institutions: MoAI, MCI, Ministry of Gender, Youth and Community Services, and CONGOMA, with MoAI in the lead.

2.7.7 Community-based associations to deal with credit, mechanization, transportation and marketing should be developed.
Participating institutions: Ministry of Commerce and Industry, MoAI, ADMARC and the Malawi Rural Finance Company, with the Ministry of Commerce and Industry in the lead.

2.7.8 Development of alternative income generating activities should be encouraged such as intensive production of high-value commodities like mushrooms.
Responsible institutions: MoAI, MIPA and MEPC, with MoAI in the lead.

2.7.9 Government to withdraw from providing services that private institutions can engage in, for example, research and extension in high-value commodities, such as horticulture and tree-nuts. Some services, such as soil testing, phytosanitary certification and quarantine, soil and seed testing, should be provided on cost-recovery basis.
Participating institution: MoAI.

2.7.10 The function of trade attaches and some foreign missions in countries, which are Malawi's major trading partners, should be reviewed with a view to strengthening their capacity to promote the country's competitiveness in the world market. Only professionals should be sent to foreign missions and such positions should not be political.
Responsible institutions: Ministry of Foreign Affairs in the lead, supported by MCI, MIPA, Exporters Association of Malawi and MEPC.

2.7.11 Functions of MIPA and MEPC should be reviewed with a view to integrating and/or amalgamating their activities.
Participating institution: NEC.

2.7.12 The National Livestock Development Master Plan should be implemented to provide a framework for investment by the private sector and other stakeholders. More benefits to the animal feed industry would emanate from a well-developed livestock industry.
Responsible institutions: MoAI, MCI and all associations in the livestock sector, with MoAI to assume leadership.

2.7.13 Land policy and Acts to be amended to allow for the development of land markets and increased access to this scarce resource.
Participating institutions: Department of Lands and Valuation, and MoAI, with the former in the lead.

2.7.14 Contract farming and out-growers schemes to be revisited with a view to increasing accessibility of resources poor households to credit, factor inputs and also to assure a ready market outlet for agricultural produce.
Responsible institutions: MoAI, ADMARC and growers' associations, with MoAI in the lead.

2.7.15 Programs to encourage value-adding through concessions on corporate tax to be considered.
Responsible institutions: Ministry of Finance, MIPA, MCI, MCCI, with Ministry of Finance in the lead.

2.7.16 Encourage consumption of locally produced goods through generic advertising using all mass media technologies.
Responsible institutions: MCI, MCCI, MEPC, growers and livestock associations, with MCI in the lead.

2.7.17 Review SADC Trade Protocol, COMESA Protocol and various bilateral trade agreements with a view to strengthening the trading position of Malawi in the region.
Responsible institutions: MCI, MEPC, Exporters Association of Malawi and MIPA, with MCI in the lead.

2.7.18 Mechanisms for encouraging mechanized smallholder farming should be developed. Possibilities of group farming should be assessed.
Responsible institutions: MoAI, Bunda College (especially the Agricultural Engineering Department), MIPA, and growers and livestock associations, with MoAI in the lead.

2.7.19 Agro-forestry technologies and alternative fuel sources should be integrated in smallholder farming (bio-gas and solar cookers). However, the supply of bio-gas will largely depend on a well-developed livestock industry. The workshop further felt that the privatization of ESCOM will entail electricity supply being concentrated in urban areas, since this is where people have money and the propensity to spend on electricity. Therefore, there is great need for alternative sources of energy.
Responsible institutions: Ministry of Fisheries, Forestry and Natural Resources in the lead, supported by MoAI, Bunda College, CONGOMA. CONGOMA to identify an appropriate NGO to participate.

2.7.20 The program of rural electrification should be expanded to support cottage agro-processing industry and other income generating activities. However, the privatization of ESCOM will greatly affect the recommendation as it might not be efficient for ESCOM to provide electricity in rural areas.
Responsible institutions: Department of Energy and Mining, ESCOM and MIPA, with Energy and Mining in the lead.

2.7.21 Market intelligence and forecasting of market trends should be institutionalized to provide farmers, processors, traders, policy makers, planners and analysts with indicators for imminent changes in the national, regional and international economic and socio-political environment.
Responsible institutions: MEPC, MCCI, MIPA, Ministry of Foreign Affairs/ Foreign missions and MoAI (Planning Division), with MEPC in the lead.

2.7.22 Market potential profiles should be available for both the foreign and domestic markets for the priority products/crops.
Responsible institution: MEPC.

2.7.23 Market intelligence, forecasting and dissemination capacity of MEPC, through provision of technical and financial support, should be strengthened.
Responsible institutions: MEPC, MoAI and MCI, with MEPC in the lead.

2.7.24 The availability of adequate financing to private sector support institutions such as MIPA, MEPC, MCCI, research institutions, Bunda College and the like should be ensured so that they can undertake their program activities effectively.
Responsible institutions: MOF, MCI and MoAI, with MOF in the lead.

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ANNEX 1

ANNEX TABLES

Annex table 1

Summary indicators for activities analyzed and sorted by return per hectare

(Smallholder farmers)

No	*Activity*	*Sector*	*MOPAM*	*DRC*	*Return/ha (MK)*	*Man-day/ha*	*Net policy effect*
1	Chicken, layer, export	Smallholder	32.0	1.19	1,725,058	8,100	174,925
2	Chicken, layer, import	Smallholder	37.5	0.95	1,725,058	8,100	164,091
3	Tomatoes	Smallholder	34.0	0.11	98,296	1,274	(1,731)
4	Cabbage	Smallholder	34.0	0.14	45,373	1,158	(1,998)
5	Onions	Smallholder	35.0	0.08	34,074	294	(1,148)
6	Potato, Irish	Smallholder	36.0	0.19	27,556	882	(1,149)
7	Tobacco, burley-auction floors	Smallholder	35.0	0.24	7,158	386	90
8	Tobacco, burley, ADMARC	Smallholder	36.5	0.50	4,525	386	297
9	Chillies	Smallholder	35.0	0.32	3,789	386	397
10	Dairy	Smallholder	32.0	0.19	3,708	213	(645)
11	Tobacco, NDDF[a/]	Smallholder	34.5	0.48	2,027	227	211
12	Tobacco, SDF	Smallholder	34.5	0.51	1,761	227	223
13	Tobacco, sun-air	Smallholder	35.5	0.53	1,542	227	233
14	Soyabeans - export	Smallholder	31.0	0.30	1,098	55	(310)
15	Soyabeans - import	Smallholder	33.0	0.09	1,098	55	121
16	Soyabean - export parity (year 2000)	Smallholder	30.0	0.34	1,098	55	(306)
17	Soyabean - import parity (year 2000)	Smallholder	33.0	0.10	1,098	55	127
18	Maize-hybrid (HAF) export	Smallholder	31.5	0.53	1,083	67	170
19	Maize-hybrid (HAF) export (year 2000)	Smallholder	31.5	0.47	1,083	67	163
20	Maize-hybrid (HAF) import	Smallholder	38.0	0.04	1,083	67	48
21	Maize-hybrid (HAF) import (year 2000)	Smallholder	38.0	0.04	1,083	67	40
22	Maize-hybrid (HAF)-wted	Smallholder	31.5	0.68	1,083	67	188
23	Maize-hybrid (HAF)-wted (year 2000)	Smallholder	31.0	0.57	1,083	67	179
24	Rice, faya	Smallholder	36.0	0.50	982	133	178
25	Rice, faya-export (year 2000)	Smallholder	36.0	0.47	982	133	174
26	Maize-hybrid(CH&LAF)-wted	Smallholder	31.5	0.79	951	67	234
27	Maize-hybrid(CH&LAF)-wted (year 2000)	Smallholder	31.5	0.64	951	67	225
28	Maize-hybrid(LAF)-wted	Smallholder	31.5	0.90	801	67	247
29	Maize-hybrid(LAF)-wted (year 2000)	Smallholder	30.0	0.73	801	67	239
30	Beans (guar)	Smallholder	48.0	0.27	781	170	53
31	Groundnuts, oil expressing - import	Smallholder	43.0	0.33	741	76	84
32	Groundnuts, oil expressing- import (year 2000)	Smallholder	43.0	0.40	741	76	91
33	Pigeon peas	Smallholder	48.0	0.32	683	134	16
34	Maize, comp (HAF)-wted (year 2000)	Smallholder	31.5	0.64	632	57	121
35	Maize, comp (HAF)-wted	Smallholder	30.5	0.78	632	57	126
36	Beef, stall feeding - Export	Smallholder	24.5	1.15	624	480	358
37	Beef, stall feeding - Import	Smallholder	29.0	0.93	624	480	214
38	Beans, phaseolus	Smallholder	47.0	0.28	537	134	115
39	Maize, local(HAF)-wted	Smallholder	30.5	0.60	522	50	43
40	Maize, local(HAF)-wted (year 2000)	Smallholder	30.5	0.50	522	50	39
41	Groundnuts, confectionery, export	Smallholder	45.0	0.29	449	76	38
42	Maize, local(NF)-wted	Smallholder	32.0	0.53	332	35	17

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Annex table 1 (concluded)

No	*Activity*	*Sector*	*MOPAM*	*DRC*	*Return/ha (MK)*	*Man-day/ha*	*Net policy effect*
43	Maize, local(NF)-wted (year 2000)	Smallholder	33.0	0.46	332	35	15
44	Cotton	Smallholder	31.0	0.38	311	108	(86)
45	Cotton (year 2000)	Smallholder	31.0	0.30	311	108	(114)
46	Sunflower, export	Smallholder	31.0	0.56	253	80	47
47	Sunflower, import	Smallholder	31.0	0.59	253	80	3
48	Sorghum, hybrid-export parity	Smallholder	32.0	3.10	(28)	80	124
49	Sorghum, hybrid-import parity (year 2000)	Smallholder	37.5	0.22	(28)	80	86
50	Sorghum, hybrid-export parity (year 2000)	Smallholder	30.0	1.85	(28)	80	121
51	Sorghum,-import parity	Smallholder	37.5	0.24	(28)	80	88
52	Goats, improved	Smallholder	22.0	3.48	(146)	183	304
53	Chicken, broiler, export	Smallholder	29.5	2.13	(1,079,684)	7,680	310,698
54	Chicken, broiler, import	Smallholder	29.5	1.68	(1,079,684)	7,680	288,081

Source: Jansen, D., and I. Hayes (1994), "Agricultural Diversification. Part I: Methodological Framework and Indicative Results; and Part II: Analysis of Diversification Options and Constraints".

a/ NDDF - Northern Division Dark-Fired Tobacco

Annex table 2

Summary indicators for activities analyzed and sorted by return per hectare

(Estates)

No	*Activity*	*Sector*	*MOPAM*	*DRC*	*Return/ha (MK)*	*Man-day/ha*	*Net policy effect*
1	Chicken, layer, export	Estate	36.0	1.17	1,824,566	9,000	(936,784)
2	Chicken, layer, import	Estate	30.5	0.93	1824566	9000	(955626)
3	Roses, irrigated – export	Estate, High Input	37.5	0.26	795079	6981	(90844)
4	Tobacco, burley-direct labour	Estate, High Input	35	0.28	10724	411	(1487)
5	Macademia	Estate	30.5	0.38	10495	127	(104)
6	Paprika	Estate, High Input (own tractor)	38.5	0.39	6893	550	(1854)
7	Groundnuts, confectionery-export	Estate, High Input (own tractor)	38.5	0.22	6667	193	(673)
8	Tobacco, burley, ADMARC	Estate, Low input	34	0.32	5261	386	(787)
9	Dairy	Estate	26	0.85	3894	40	(830)
10	Soyabean – export	Estate, Low input,hoe	33.5	0.18	1569	55	(227)
11	Soyabean – export, (year 2000)	Estate, Low input,hoe	33	0.2	1569	55	(223)
12	Soyabean –import	Estate, Low input,hoe	36.5	0.1	1569	55	(270)
13	Soyabean – import(year 200)	Estate, Low input,hoe	36.5	0.11	1569	55	(264)
14	Soyabean – export	Estate, High Input (own tractor)	30.5	0.43	1346	22	(370)
15	Soyabean – export(year 2000)	Estate, High Input (own tractor)	31.5	0.49	1346	22	(363)
16	Soyabean – import	Estate, High Input (own tractor)	34	0.21	1346	22	(444)
17	Soyabean – import (year 2000)	Estate, High Input (own tractor)	31.5	0.23	1346	22	(434)
18	Cashews	Estate, High Input	35.5	0.25	747	44	(121)
19	Groundnuts, confectionery-export	Estate, Low input,hoe	43	0.24	659	170	(303)
20	Sorghum-export	Estate, Low input,hoe	29	0.5	441	100	(249)
21	Sorghum-export,(year 2000)	Estate, Low input,hoe	32	0.42	441	100	(254)
22	Sorghum-import	Estate, Low input,hoe	34.5	0.21	441	100	(284)
23	Sorghum-import(year 2000)	Estate, Low input,hoe	33.5	0.19	441	100	(288)
24	Beef, stall feeding-export	Estate	21.5	1.05	225	36	(627)
25	Beef, stall feeding-import	Estate	27	0.84	225	36	(680)
26	Sunflower-export	Estate, Low input,hoe	32	0.56	91	80	(116)
27	Sunflower-import	Estate, Low input,hoe	28	0.58	91	80	(159)
28	Maize-hybrid-int import(year 2000)	Estate, Low input,hoe	34	0.12	(87)	70	(314)
29	Maize-hybrid-regl export(year 2000)	Estate, Low input,hoe	26	0.57	(87)	70	(211)
30	Maize-hybrid-regl import(year 2000)	Estate, Low input,hoe	31.5	0.28	(87)	70	(241)
31	Maize-hybrid-int import	Estate, Low input,hoe	34	0.13	(87)	70	(310)
32	Maize-hybrid-regional export	Estate, Low input,hoe	26	0.67	(87)	70	(207)
33	Maize-hybrid-regional import	Estate, Low input,hoe	31.5	0.3	(87)	70	(237
34	Cotton	Estate, Low input,hoe	36	0.39	(101)	108	(365)
35	Cotton (year 2000)	Estate, Low input,hoe	38	0.31	(101)	108	(393)
36	Cotton	Estate, High input,tractor	33.5	0.35	(129)	60	(864)
37	Cotton (year 2000)	Estate, High input,tractor	33.5	0.28	(129)	60	(936)
38	Maize-hybrid-Int import(year 2000)	Estate, High input,Estate	32.5	0.09	(287)	63	(813)
39	Maize-hybrid-regl export(year 2000)	Estate, High input	29	0.41	(287)	63	(554)
40	Maize-hybrid-regl import(year 2000)	Estate, High input	30	0.2	(287)	63	(630)
41	Maize-hybrid-int import	Estate, High input	32.5	0.09	(287)	63	(802)
42	Maize-hybrid-regional export	Estate, High input	25	0.59	(287)	63	(544)
43	Maize-hybrid-regional import	Estate, High input	30	0.22	(287)	63	(620)
44	Sunflower-export	Estate, High input,own tractor	18	1.32	(475)	63	(327)
45	Sunflower-import	Estate, High input,own tractor	19.5	1.08	(475)	63	(457)
46	Sorghum – export	Estate, High input,tractor	28	3.51	(525)	39	(384)
47	Sorghum-export(year 2000)	Estate, High input,tractor	28	1.64	(525)	39	(391)
48	Sorghum – import	Estate, High input,tractor	29	0.37	(525)	39	(434)
49	Sorghum-import(year 2000)	Estate, High input,tractor	30	0.33	(525)	39	(440)
50	Wheat irrig export	Estate, High input,own tractor	16	26.52	(4125)	23	(854)
51	Wheat irrig export (year 2000)	Estate, High input,own tractor	16	20.75	(4125)	23	(862)
52	Wheat irrig import (year 2000)	Estate, High input,own tractor	19	1.14	(4125)	23	(937)
53	Wheat irrig-import	Estate, High input,own tractor	16	1.27	(4125)	23	(930)
54	Chicken, broiler, export	Estate	26	1.6	(1156998)	9600	(1429433)
55	Chicken, broiler,import	Estate	26	1.27	(1156998)	9600	1401161

Source: Jansen, D., and I. Hayes (1994), "Agricultural Diversification. Part I: Methodological Framework and Indicative Results" and "Part II: Analysis of Diversification Options and Constraints".

Annex table 3

Domestic Resource Cost (DRC) ratios by commodity

	Activity	*Destination*	*Parity basis*	*Farm gate price(MK/kg)*	*DRC*
1	Smallholder coffee	Blantyre-Hararer	export parity	13.08	0.09
2	Hybrid maize	Harare-Blantyre	import parity	15.40	0.10
3	Sorghum	Blantyre-Harare	export parity	6.51	0.10
4	Paprika	Blantyre-Harare	export parity	80.56	0.11
5	Beans/Maize	Blantyre-Harare	export parity		0.11
6	Beans/Maize	Lilongwe-Lusaka	export parity		0.12
7	Beans	Lilongwe-Lusaka	export parity	24.96	0.13
8	Soyabean	Lilongwe-Lusaka	export parity	7.77	0.14
9	Beans	Blantyre-Harare	export parity	32.56	0.14
10	Local maize	Harare-Blantyre	import parity	15.40	0.17
11	Irish potato	Blantyre-Harare	export parity	25.00	0.17
12	Pigeon peas/Maize	Blantyre-Harare	export parity		0.19
13	Cassava	Harare-Blantyre	import parity	4.16	0.22
14	Rice	Blantyre-Harare	export parity	11.50	0.25
15	Groundnuts	Lilongwe-Lusaka	export parity	15.93	0.29
16	Smallholder tobacco (burley)	Blantyre-Harare	export parity	95.04	0.29
17	Sunflower	Harare-Blantyre	import parity	7.34	0.32
18	Estate tobacco(flue-cured)	Blantyre-Harare	export parity	105.60	0.33
19	Estate tobacco (burley)	Blantyre-Harare	export parity	95.04	0.35
20	Green pepper	Blantyre-Harare	export parity	15.00	0.37
21	Cabbage	Blantyre-Harare	export parity	40.00	0.38
22	Macadamia (estate)	Blantyre-Harare	export parity	270.00	0.40
23	Hybrid maize	Blantyre-Harare	export parity	4.84	0.45
24	Rice (irrigated)	Blantyre-Harare	export parity	5.00	0.53
25	Local maize	Blantyre-Harare	export parity	4.84	0.55
26	Onions	Blantyre-Harare	export parity	10.00	0.57
27	Tomato	Blantyre-Harare	export parity	15.00	0.59
28	Poultry (broilers)	Harare-Blantyre	import parity	55.00	0.60
29	Cotton	Blantyre-Harare	export parity	8.06	0.60
30	N. D. Dark Fire tobacco	Blantyre-Harare	export parity	100.00	0.61
31	Estate coffee	Blantyre-Harare	export parity	165.00	0.62
32	Rapeseed/Chinese cabbage	Blantyre-Harare	export parity	10.00	0.65
33	Estate tea (clonal)	Blantyre-Harare	export parity	52.27	0.76
34	Poultry (layers)	Harare-Blantyre	import parity	1.38	0.98
35	Poultry (broilers)	Blantyre-Harare	export parity	40.00	1.13
36	Poultry (layers)	Blantyre-Harare	export parity	0.55	4.88

Annex table 4

Benefit/Cost ratios by commodity

	Activity	*Destination*	*Parity basis*	*Frame gate*	*DRC*	*B/C ratio*
1	Sorghum	Blantyre-Harare	export parity	6.51	0.10	6.57
2	Smallholder coffee	Blantyre-Harare	export parity	13.08	0.09	5.96
3	Local maize	Harare-Blantyre	import parity	15.40	0.17	5.61
4	Beans/Maize	Blantyre-Harare	export parity		0.11	5.54
5	Beans/Maize	Lilongwe-Lusaka	export parity		0.12	5.21
6	Beans	Blantyre-Harare	export parity	32.56	0.14	4.69
7	Paprika	Blantyre-Harare	export parity	80.56	0.11	4.28
8	Beans	Lilongwe-Lusaka	export parity	24.96	0.13	3.59
9	Hybrid maize	Harare-Blantyre	import parity	15.40	0.10	3.42
10	Cassava	Harare-Blantyre	import parity	4.16	0.22	3.39
11	Pigeon/Maize	Blantyre-Harare	export parity		0.19	3.35
12	Sunflower	Harare-Blantyre	import parity	7.34	0.32	2.87
13	Irish potato	Blantyre-Harare	export parity	25.00	0.17	2.59
14	Rice	Blantyre-Harare	export parity	11.50	0.25	2.53
15	Smallholder tobacco (burley)	Blantyre-Harare	export parity	95.04	0.29	2.44
16	Estate tobacco(flue-cured)	Blantyre-Harare	export parity	105.60	0.33	2.21
17	Estate tobacco (burley)	Blantyre-Harare	export parity	95.04	0.35	2.21
18	Soyabean	Lilongwe-Lusaka	export parity	7.77	0.14	2.14
19	Groundnuts	Lilongwe-Lusaka	export parity	15.93	0.29	1.91
20	Local maize	Blantyre-Harare	export parity	4.84	0.55	1.76
21	Green pepper	Blantyre-Harare	export parity	15.00	0.37	1.64
22	Onions	Blantyre-Harare	export parity	10.00	0.57	1.57
23	Rice (irrigated)	Blantyre-Harare	export parity	5.00	0.53	1.51
24	Estate coffee	Blantyre-Harare	export parity	165.00	0.62	1.49
25	N. D. Dark Fire tobacco	Blantyre-Harare	export parity	100.00	0.61	1.46
26	Cabbage	Blantyre-Harare	export parity	40.00	0.38	1.42
27	Cotton	Blantyre-Harare	export parity	8.06	0.60	1.41
28	Rapeseed/Chinese cabbage	Blantyre-Harare	export parity	10.00	0.65	1.33
29	Poultry (broilers)	Harare-Blantyre	import parity	55.00	0.60	1.31
30	Estate tea (clonal)	Blantyre-Harare	export parity	52.27	0.76	1.29
31	Tomato	Blantyre-Harare	export parity	15.00	0.59	1.19
32	Poultry (layers)	Harare-Blantyre	import parity	1.38	0.98	1.08
33	Poultry (layers)	Blantyre-Harare	export parity	0.55	4.88	1.08
34	Hybrid maize	Blantyre-Harare	export parity	4.84	0.45	1.07
35	Poultry (broilers)	Blantyre-Harare	export parity	40.00	1.13	0.95
36	Macadamia (estate)	Blantyre-Harare	export parity	270.00	0.40	0.71

Annex table 5

Gross margins by commodity

	Activity	*Destination*	*Parity basis*	*Farm gate price(MK/kg)*	*DRC*	*B/C ratio*	*Margin after labour cost*
1.	Estate tobacco (tlue-cured)	Blantyre-Harare	export parity	105.60	0.33	2.21	200,285.70
2.	Estate coffee	Blantyre-Harare	export parity	165.00	0.62	1.49	163,596.63
3.	Green pepper	Blantyre-Harare	export parity	15.00	0.37	1.64	112,738.26
4.	Cabbage	Blantyre-Harare	export parity	40.00	0.38	1.42	107,021.25
5.	N. D. Dark Fire tobacco	Blantyre-Harare	export parity	100.00	0.61	1.46	106,590.30
6.	Estate tobacco (burley)	Blantyre-Harare	export parity	95.04	0.35	2.21	104,174.28
7.	Smallholder tobacco (burley)	Blantyre-Harare	export parity	95.04	0.29	2.44	84,030.79
8.	Paprika	Blantyre-Harare	export parity	80.56	0.11	4.28	80,261.00
9.	Poultry (broilers)	Harare-Blantyre	import parity	55.00	0.60	1.31	79,870.00
10.	Poultry (layers)	Harare-Blantyre	import parity	1.38	0.98	1.08	69,585.00
11.	Poultry (layers)	Blantyre-Harare	export parity	0.55	4.88	1.08	69,585.00
12.	Smallholder coffee	Blantyre-Harare	export parity	13.08	0.09	5.96	65,307.00
13.	Poultry (broilers)	Blantyre-Harare	export parity	40.00	1.13	0.95	52,360.00
14.	Estate tea (clonal)	Blantyre-Harare	export parity	52.27	0.76	1.29	43,484.31
15.	Hybrid maize	Harare-Blantyre	import parity	15.40	0.10	3.42	32,682.90
16.	Tomato	Blantyre-Harare	export parity	15.00	0.59	1.19	31,252.15
17.	Irish potato	Blantyre-Harare	export parity	25.00	0.17	2.59	27,599.68
18.	Beans/Maize	Blantyre-Harare	export parity		0.11	5.54	26,056.00
19.	Beans/Maize	Lilongwe-Lusaka	export parity		0.12	5.21	24,156.00
20.	Rapeseed/Chinese cabbage	Blantyre-Harare	export parity	10.00	0.65	1.33	21,235.80
21.	Macadamia (estate)	Blantyre-Harare	export parity	270.00	0.40	0.71	21,235.80
22.	Onions	Blantyre-Harare	export parity	10.00	0.57	1.57	18,174.10
23.	Pigeon/Maize	Blantyre-Harare	export parity		0.19	3.35	13,407.50
24.	Beans	Blantyre-Harare	export parity	32.56	0.14	4.69	11,526.00
25.	Rice	Blantyre-Harare	export parity	11.50	0.25	2.53	10,442.50
26.	Local maize	Harare-Blantyre	import parity	15.40	0.17	5.61	10,125.00
27.	Beans	Lilongwe-Lusaka	export parity	24.96	0.13	3.59	8,106.00
28.	Rice (irrigated)	Blantyre-Harare	export parity	5.00	0.53	1.51	7,575.92
29.	Cassava	Harare-Blantyre	import parity	4.16	0.22	3.39	7,330.00
30.	Sorghum	Blantyre-Harare	export parity	6.51	0.10	6.57	5,960.80
31.	Groundnuts	Lilongwe-Lusaka	export parity	15.93	0.29	1.91	3,805.00
32.	Soyabean	Lilongwe-Lusaka	export parity	7.77	0.14	2.14	3,776.00
33.	Sunflower	Harare-Blantyre	import parity	7.34	0.32	2.87	2,153.00
34.	Cotton	Blantyre-Harare	export parity	8.06	0.60	1.41	1,864.11
35.	Local maize	Blantyre-Harare	export parity	4.84	0.55	1.76	1,677.00
36.	Hybrid maize	Blantyre-Harare	export parity	4.84	0.45	1.07	1,002.90

Annex table 6

Multiple Objective Policy Analysis Matrix (MOPAM) scores

	Drought tolerance	*Price variability*	*Income generation*	*Food security*	*Employ-ment*	*Diversi-fication*	*Total*
Macadamia	4	5	5	4	5	5	28
Estate coffee	3	4	5	4	5	4	25
Cassava	5	4	4	5	2	4	24
Irish potato	3	5	4	4	3	4	23
Smallholder coffee	3	4	4	3	4	4	22
Estate tobacco (flue)	1	4	5	4	4	4	22
N. D. Dark Fire tobacco	1	3	5	4	4	4	21
Paprika	1	4	4	3	4	5	21
Estate tea	3	3	4	3	4	3	20
Beans	1	4	4	4	3	4	20
Rice	1	3	4	4	4	4	20
Poultry (layers)	1	4	4	3	5	3	20
Poultry (broilers)	1	4	4	3	5	3	20
Tomato	1	4	4	3	3	4	19
Groundnuts	1	4	4	3	2	4	18
Hybrid maize	1	3	4	4	2	3	17
Smallholder burley	1	2	4	4	3	3	17
Sorghum	4	3	2	3	1	3	16
Beans/Maize	1	3	3	4	2	3	16
Beans/Pigeon peas	1	3	3	4	2	3	16
Soyabean	2	2	3	3	2	4	16
Sunflower	2	3	3	2	3	3	16
Rape/Chinese cabbage	1	4	3	3	2	3	16
Cotton	3	3	2	1	2	4	15
Onions	1	4	3	3	1	2	14
Cabbage	1	4	3	2	1	2	13
Local maize	1	3	2	3	1	2	12
Green pepper	1	4	3	1	1	2	12

Annex table 7

Multiple Objective Policy Analysis Matrix (MOPAM) scores, based on a Task Force on Diversification

	Drought	*Competi-tiveness (DRC)*	*Income generation*	*Food security*	*Employ-ment*	*Environ-ment*	*Production*	*Technology*	*Total*
Cereals									
Wheat	0.34	0.17	1.11	0.72	0.73	0.59	0.62	0.54	4.83
Millet	0.66	1.29	0.81	1.01	0.6	0.53	0.87	0.61	6.38
Sorghum	0.7	1.29	2	1	0.67	0.56	0.92	0.64	6.64
Rice	0.27	0.91	1.27	1.03	0.69	0.5	0.7	0.76	6.12
Legumes									
Beans	0.32	1.16	1.34	0.96	0.88	0.78	1.17	0.87	7.47
G.Nuts	0.3	0.92	1.36	0.84	0.88	0.78	1.2	0.87	7.15
P.Peas	0.62	1.01	1.19	0.82	0.76	0.89	1.09	0.64	7.02
Sunflower	0.34	0.69	0.87	0.53	0.57	0.48	0.73	0.51	4.73
Soyabeans	0.33	1.14	1.21	0.79	0.81	0.83	1.06	0.68	6.86
Cash Crops									
Cotton	0.63	0.64	1.23	0.76	0.93	0.44	0.81	0.71	6.15
Root Crops									
Cassava	0.83	0.92	1.25	1.28	0.72	1.12	0.68	0.68	7.48

Source: Malindi, E., C. Mataya, Z.Chikhosi, C. Jumbe, J. Luhanga, I. Kumwenda, and S. Hiwa, Task Force on Agricultural Diversification, Ministry of Agriculture and Irrigation, Lilongwe, 2000.

Annex table 8

Ranking of 10 commodities by DRC ratios, Benefit/Cost ratios, Gross Margins after labour cost and MOPAM scores

	Ranking by Criteria									
Criteria	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*
DRC	Smallholder coffee	Sorghum	Paprika	Beans/ Maize	Beans/ Maize	Beans	Soyabean	Beans	Irish potato	Pigeon/ Maize
B/C	Sorghum	Smallholder coffee	Local maize	Beans/ Maize	Beans/ Maize	Beans	Paprika	Beans	Hybrid maize	Cassava
Gross Margin	Estate tobacco (flue cured)	Estate coffee	Greenr peppe	Cabbage	NDDF tobacco [a/]	Estate burley tobacco	Smallholder burley	Paprika	Broilers	Layers
MOPAM	Macadamia	Estate coffee	Cassava	Irish potato	Estate tobacco (flue-cured) Smallholder coffee	Paprika NDDF tobacco	Broilers Layers Rice Beans Estate tea	Tomato	Groundnuts	Smallholder burley tobacco Smallholder tobacco Hybrid maize
MOPAM by Task Force	Cassava	Beans	Groundnuts	Pigeon peas	Soyabeans	Millet	Sorghum	Cotton	Rice	Wheat

NDDF - Northern Division Dark-Fired Tobacco
Beans/Maize: Rank 4 is based on Blantyre-Harare export parity price, whereas Rank 5 is based on Lilongwe-Lusaka..
Beans: Rank 6 is based on Lilongwe-Lusaka export parity price, whereas Rank 8 is based on Blantyre-Harare

ANNEX 2

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ANNEX 3

CONSULTANTS' TERMS OF REFERENCE

The objective of the project is to assess potential agricultural alternatives to production and export marketing of tobacco from Malawi, based on comparisons between these alternatives and tobacco as regards domestic income, employment and national export earnings. Other social and environmental factors will be considered to the extent possible. The project aims to arrive at practical conclusions and recommendations that interested producers may wish to follow.

The project will provide information, not only on the profitability of alternatives, but also on their employment potential and export earnings potential at the national level, as compared with tobacco. The social needs of employing large number of workers currently engaged in tobacco production will thus be taken into account.

The project will contribute to the long-term process of diversification and it should clarify options and result in recommendations to the private and public sectors on further action on production and export marketing of new agricultural products that have high rates of return and fast growth potential as well as good employment and export earnings potentials.

An indirect result of the project is expected to be fostering of cooperation among producers of new agricultural products and capacity building for resolving some problems which constrain diversification out of tobacco and into new agricultural products for export.

Assistance from UNDP and UNCTAD is being given in furtherance of ECOSOC resolution 1993/79 which expressed concern about the possible economic effects of reduced tobacco production in the tobacco-producing countries which are still unable to develop viable economic alternatives to tobacco production. The resolution invited organizations of the United Nations system to develop a range of options, including multilateral collaboration on agricultural diversification, to assist economies for which tobacco is a major export, where demand for their tobacco products has decreased as a result of successful strategies for tobacco control. ECOSOC resolution 1994/47 repeated the need to address all the issues raised in resolution 1993/79, with national plans of action to be developed, upon request, taking into account the economic and social aspects of tobacco production and consumption as well as the serious health consequences of tobacco use.

The aspect of economic effects of reduced tobacco production in the tobacco-producing countries is becoming more urgent in view of the recent weakening of demand and prices for Central African tobaccos. Uncertainty about legislation on tobacco issues in the United States has negatively affected demand and prices for Central African tobaccos. Plans to launch an Intergovernmental

Negotiating Body on drafting a WHO Framework Convention on Tobacco Control are also likely to significantly bear on future demand and prices.

UNCTAD is supporting the project as part of its long-standing efforts to promote commodity trade and diversification as a means to advance economic development in exporting developing countries. Further, in December 1993, the UN Secretary-General established a Focal Point in UNCTAD to coordinate multisectoral collaboration on the economic and social aspects of tobacco production and consumption, taking into account the serious health consequences of tobacco use.

Activities:

1. Prepare a background paper on :
   (a) Findings of existing studies on diversification in Malawi and factors that have led to lack of implementation of their recommendations.
   (b) Possible further work under this project to :
      1. Identify market opportunities for new and processed products that are alternatives to tobacco production;
      2. Identify production possibilities for these alternatives;
      3. Evaluate alternative use for capital equipment used for tobacco production that would be displaced.
   (c) Contribute advice on the practical arrangements necessary to support the planned research.
2. Present the background paper and discuss it at the First Workshop for representatives of growers' organizations, Government ministries and the private sector. The Workshop will make recommendations on the content of the study to be undertaken. Details on the qualifications and tasks of national consultants, who will prepare the background discussion paper, are attached as an annex.
3. National consultants will carry out the study, according to the terms of reference that will be based on the recommendations of the First Workshop. A Steering Committee will make arrangements to assist the consultants and ensure that the consultants' work is carried out according to the terms of reference. The Ministry of Agriculture and Irrigation will be the focal point of the Steering Committee and will work in close co-operation with the Ministry of Commerce and Industry, and in consultation with UNCTAD and UNDP.

Annex:

Qualifications and Tasks of National Consultants to Prepare a Background Paper for the First Workshop

A qualified Senior Production Specialist with wide experience in production of a range of crops in Malawi, including tobacco. The person will review completed studies on alternatives to tobacco production and compare these alternative products with tobacco as regards, profitability, employment of workers and export earnings as well as assess social and environmental implications. The person will be familiar with economic factors relating to agriculture, including legislative requirements, financing structure, incentive policies, taxation policies, land tenure procedures, agricultural employment, and domestic marketing and processing. Knowledge of the structure of the agricultural sector, including Min-

istry resources, farming sector professional organizations and research agencies, both public and private sector, is also necessary. The person will be qualified to draw conclusions from the analysis and draft a diversification strategy and an action plan.

A qualified Senior Marketing Specialist with experience in marketing of new and processed products exported by Malawi to regional and international markets as well as marketed domestically. The person will assess the market potential for new and processed products in export markets, including high-value, low-volume products, such as horticultural products. The specialist will also assess domestic markets where home production can substitute for imports. The person will be qualified to draw conclusions from the analysis and draft a diversification strategy and an action plan.