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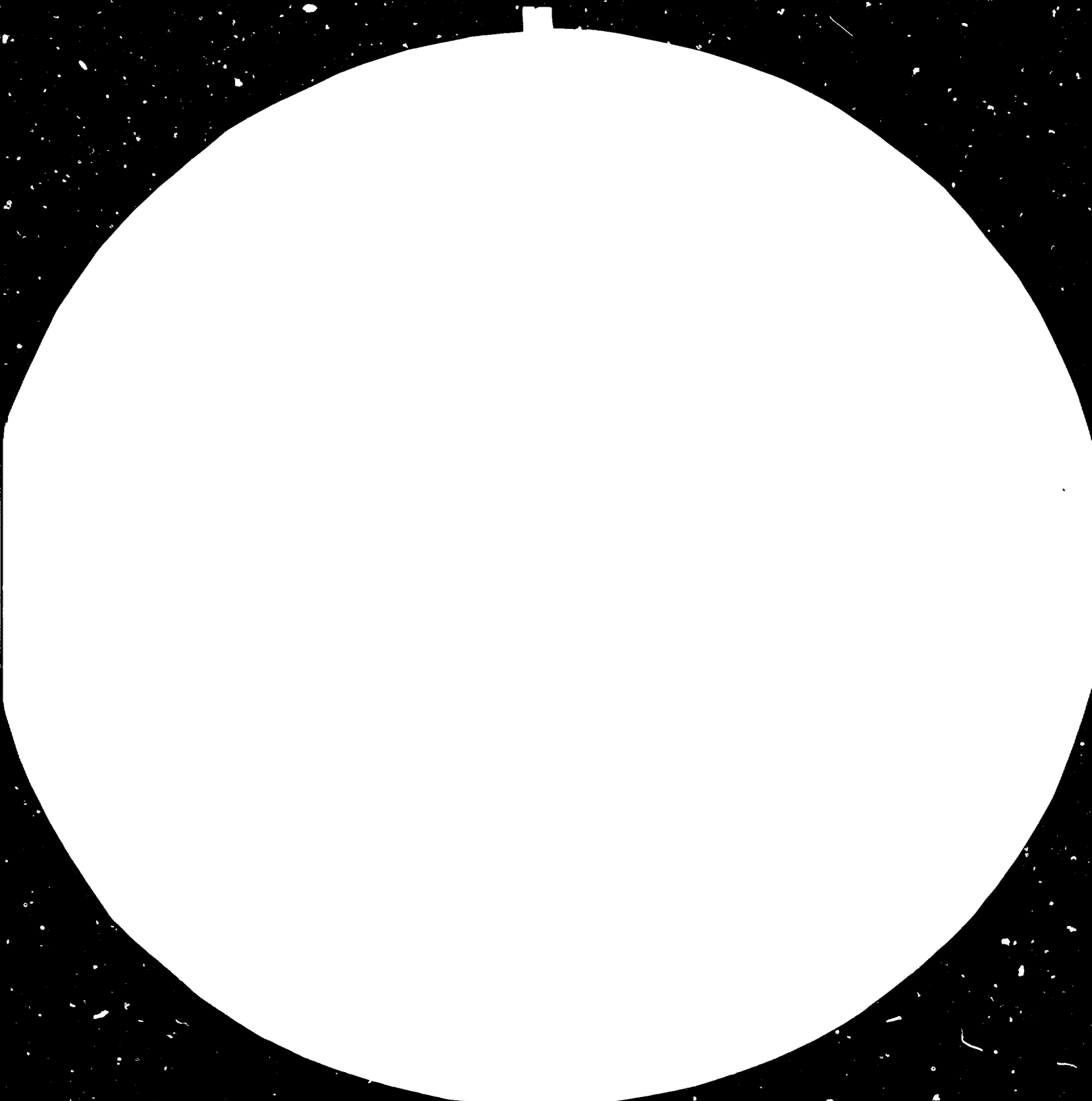

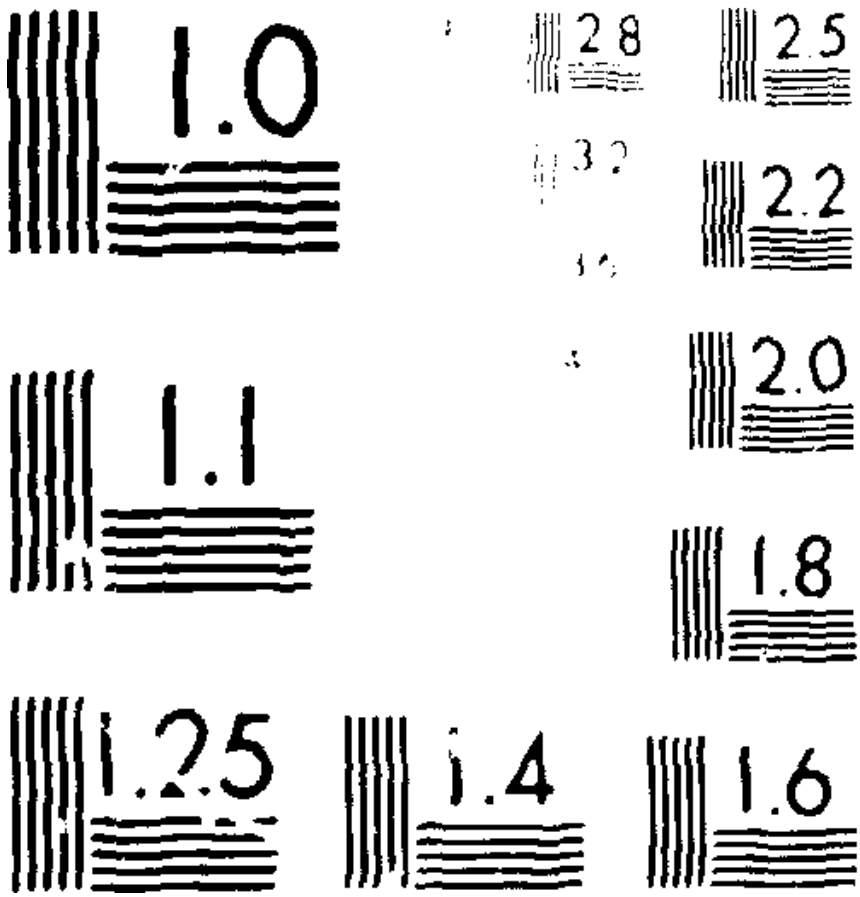

12682

Distr.
LIMITED
UNIDO/IS.389
15 June 1983
ENGLISH

UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION

MALAWI.

THE POTENTIAL
FOR RESOURCE-BASED INDUSTRIAL DEVELOPMENT
IN THE LEAST DEVELOPED COUNTRIES

No.5

MALAWI

Ian Livingstone

Prepared by the
Division for Industrial Studies
Regional and Country Studies Branch

778

V.83-67217

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PREFACE

One of the special measures in favour of least developed countries called for in the New Delhi Declaration and Plan of Action adopted at the Third General Conference of UNIDO, was to "assist in the establishment of comprehensive inventories of their resources, particularly alternative energy sources, and prepare industrial surveys of these countries to support endogenous exploitation of their resources".[1/] The Division for Industrial Studies, UNIDO, has therefore, as part of its country studies programme, initiated the preparation of a series of industrial development studies pertaining to the least developed countries.

This study on Malawi has been prepared during 1982 under sub-contract by Professor Ian Livingstone, University of East Anglia, in consultation with the staff of the Division for Industrial Studies, UNIDO. It is hoped that the study findings and conclusions will be considered by the Government of Malawi in connexion with industrial policy formulation, project promotion work and other activities aimed at supporting the country's industrial development. It is specifically expected that the study will contribute to the development of industrial policies, programmes and projects. The views and opinions expressed in the study are those of author and do not necessarily reflect the views of the secretariat of UNIDO or those of the Goverment of Malawi.

1/ Para. 296 of the Declaration and Plan of Action on Industrialization of Developing Countries and International Co-operation adopted at the Third General Conference of UNIDO, New Delhi, 21 January - 9 February 1980.

CHAPTER I

GENERAL ECONOMIC BACKGROUND

1.1 Malawi is one of the poorest countries in the world, with a per capita GNP in 1979 of US $200, and is primarily agricultural with a large non-monetary sector. It has so far not been 'thrown a lifeline' by the discovery of any high-valued mineral deposit yielding incomes, tax revenue or linkages into industrial development. It is disadvantaged in the pursuit of an import-substituting industrial strategy by its small domestic market comprising under six million people with, as we shall see, a particularly low level of rural purchasing power and a quite small urban sector. And disadvantaged in respect of an export-oriented industrial strategy by being entirely land-locked with poorly organised communications to the sea through Mozambique. A further potential disadvantage, although adding to an already plentiful supply of cheap labour which in the past has migrated for work to other countries, has been the high rate of population growth, equal to an estimated 2.86 per cent per annum over the period 1966 to 1977.

1.2 Yet Malawi has been praised for its economic performance in general, and for its industrial development in particular, as something of a success story in Africa. The recent World Bank report on development in sub-Saharan Africa includes at different points illustrative case studies intended as a 'message' for other countries, and in the case of industry it is Malawi which is picked out:

> Malawi is a good example of how a small African country with little apparent industrial potential can enjoy a high rate of manufacturing growth while following an agriculture-oriented development strategy... The approach to industry has been far from laissez-faire - the Government has provided protection for infant industries and has actively promoted industry through parastatal investment - but strict limits have been set on industrial promotion. There is a moderate tariff,

> which ranges from 7.5 to 40 per cent... quantitative restrictions have not been used to restrict imports nor to protect industry, and the exchange rate has been kept at a level that not only encourages exports growth but also maintains external balance.
>
> These policies help explain why manufacturing has grown even faster than agriculture in Malawi. During 1968-77, total industrial value added in real terms grew at an annual average rate of 6.5 per cent, while agriculture grew at 4.5 per cent. Equally important, because of the kind of industry that has developed, and because of a wage policy that has held down urban wages, manufacturing employment also grew at 6.5 per cent per year during 1968-77. Few African countries have had a higher rate of growth of employment in manufacturing. (our italics)1/

Domestic savings increased from almost zero in 1964 to 11.5 per cent of GDP in 1976. By 1979, the share of investment in GDP had risen to 29 per cent and domestic savings to 17 per cent. Data for investment, including inventories, as a proportion of GDP at constant 1970 prices (Table 1.1) shows an even higher peak of 37 per cent in 1978 and of 20 per cent for savings in the same year, the latter, however, falling away subsequently in 1979 and 1980. Still measuring at constant 1970 prices, GDP grew by 80 per cent over the decade 1970 to 1980 (monetary GDP by 112 per cent), with a similar 83 per cent increase in manufacturing and mining (Table 1.2).

1.3 This economic growth may be described as export-led, based particularly on the three main export crops, tobacco, tea and sugar, which between them currently contribute an average of nearly 80 per

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1/ IBRD, Accelerated Development in Sub-Saharan Africa, in Agenda for Action, Washington, 1981, p.92.

cent of Malawi's domestic exports (Table 1.3). Total domestic exports at current prices grew from K40.6 million in 1970 to K226.0 million in 1980 (Table 1.4), this increase being due especially to the expansion of estate agriculture. Though government policy towards agriculture in Malawi is said to have been 'two-pronged' in that efforts have been made through integrated agricultural development projects to promote smallholder agriculture, the major impact has clearly been on the estate side, with tobacco, tea and sugar being developed primarily as estate crops. As a result the position changed between 1969, when smallholder crops accounted for 49.5 per cent of domestic exports, compared to 44.3 per cent for estate crops, and 1980, when the relative percentages were respectively 18.3 and 68.2, a remarkable transformation (Table 1.5). Associated with this change was an increase in the share of tobacco from 34.4 per cent in 1969 to 56.3 per cent in 1979. While the performance of the estate sector has undoubtedly been impressive, and has also directly contributed to the very satisfactory rate of growth of manufacturing value added over this period, the emphasis on large-scale agriculture could prove to have disadvantages for development in the long run, as will be argued later.

1.4 Malawi does not appear to have suffered any secular deterioration in her terms of trade. The commodity terms of trade fluctuated over the period 1965-1977, but were at the same level in these two end years (Table 1.6). The sharp deterioration was in the period 1977-1980 when the index (1979=100) fell from 141.8 to 93.0, a fall of 34 per cent, as a result of a 6.5 per cent fall in the unit value of exports but, especially, of a 42.5 per cent increase in the unit value of imports (159 per cent increase over 1973, but compensated by export price increases until 1977), reflecting primarily changes in petroleum prices. These more than doubled between 1970 and 1974 and then almost tripled again between 1974 and 1981 (Table 1.7). Nevertheless Malawi was able to 'ride' the effects of increasing import prices up to 1977 - though obviously at considerable cost - so that the economic crisis dates from that time, when its own commodity boom came to a halt. These changes can also be observed by comparing the commodity terms of trade which fall from 1977 onwards (Table 1.8) and the income terms of trade, which held up until 1980, before falling sharply in 1981. The break in trend as regards economic growth is reflected spectacularly in the change in the average annual rate of growth of GDP at constant factor

cost from 6.1 per cent over the period 1973-79 to just 0.5 per cent over the two years 1979-81 (Table 1.9). Prospects for the decade from 1981 are obviously rather difficult to assess, given the uncertain state of the world economy, but are discussed in a later section.

1.5 Malawi is unusual for a developing country of its size in never having had a formal four- or five-year development plan. 'DEVPOL', the "Statement of Development Policies 1971-80", is a comparatively short document laying out the Government's intentions and proposed policies, and does not contain detailed sectoral capital and recurrent allocations for four or five years ahead. It is put forward as a 'statement of intent', to be supplemented by a much more flexible three-year 'rolling' public sector investment programme, the first year of which is revised annually to take into account developing circumstances. Malawi's own satisfactory rate of growth and disillusion which has appeared elsewhere with the routine of preparing large but inflexible plan documents (even in neighbouring socialist Tanzania) has justified this early decision.

1.6 At the same time this does not mean that there is no need periodically to review overall progress and to reassess strategy. The Economic Planning Division of the Office of the President has begun work on a successor to DEVPOL, although it is not envisaged that this will involve any fundamental change of policy. Despite the obvious degree of success which has been obtained, some re-orientation is considered here to be desirable, and this study is offered as a contribution to the appraisal which is being carried out.

1.7 The most prominent features of development policy in Malawi over the decade, consistent with DEVPOL, may be said to have been: (a) encouragement of the private sector (including the development of an indigenous Malawian entrepreneurial class), and of foreign investment - although parastatal organisations have been used as a vehicle for the promotion of local and foreign enterprise to a greater extent, probably, than originally envisaged;[1/] (b) a

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1/ The emphasis on the private sector is probably responsible for the fact that the quasi-public Press Holdings was initiated in 1960, well before the orthodox Malawi Development Corporation was launched in 1964.

two-pronged agricultural development policy combining the expansion of the estate sector with promotion of smallholders through rural development projects - a policy which may be said, however, not to have been applied sufficiently even-handedely in practice; (c) a low-wage policy; and (d) maintenance of an open economy and avoidance of excessive protection of industry.

1.8 These are interrelated, so that taking into account the scarcity of local entrepreneurship at independence, there has been a deliberate attempt to provide a climate which would encourage foreign investment, through the main tenance of low wages, liberal trade and external payments policies, and moderate tax levels.

1.9 DEVPOL also makes explicit reference to the disadvantages of pursuing a policy of import substituting industrialization, given a market the size of Malawi's, and the need therefore to adopt an export-oriented strategy based on utilizing comparative advantages and resource availabilities within Malawi. There is specific reference, for instance, to the Viphya forests as an important natural resource as well as, of course, Malawi's agricultural resource base. The policy subsequently pursued by Malawi, now for more than a decade, has been in line with this, so that Malawi has indeed already been pursuing a strategy of resource-based industrial development for a considerable time.

1.10 In this context it will be useful to consider not only what opportunities can be identified for specific resource-based activities but to assess what prospects exist for further resource-based activity as a whole or, alternatively, how much 'steam' remains in the resource-based industrial development strategy which has clearly met with a great deal of success so far. This may throw light more generally on the usefulness or limitations of such a strategy.

CHAPTER II

STRUCTURE AND EVOLUTION OF THE INDUSTRIAL SECTOR

2.1 Revised figures just issued by the National Statistical Office (Table 2.1) suggest that we should be much more cautious in assessing manufacturing development in Malawi than some of the recent reports. Manufacturing value added increased by 61 per cent over the period 1973-79 (six years). However 45 of the 61 per cent were over the period 1973-75, with only a further 11 per cent during 1975-79. Since world economic recession and the effects of continued oil price increases on foreign exchange availability have adversely affected the situation in Malawi since that time, it would appear that the annual rate of growth of manufacturing over the entire seven-year period 1975-82 will prove to have been quite low, suggesting a distinct loss of earlier momentum, even if to an important extent external factors have contributed to this. According to the latest Economic Report, the percentage increase in GDP at constant 1978 factor cost was just under 3.6 per cent in total over the three years 1979-82, though the estimate for the increase in manufacturing, likely to be revised downwards in line with the figures given above, was 12 per cent. The N.S.O. Index of Manufacturing Output (1970=100) shows the same pattern: an 80 per cent increase from 1970 to 1975, followed by a 24 per cent increase, only to 1980, though with a significant forward spurt in 1981 associated with Food, Beverages and Tobacco, and in particular with Sugar (Table 2.2).

2.2 This picture does not tally fully with that of the recent IBRD Report on the Development of Manufacturing which refers to the manufacturing sector's having grown at an annual rate of 11-13 per cent between 1964 and 1975 and states that although "In 1976, output declined for the first time, due mainly to constraints in the external sector... In 1977/78 growth resumed at an annual rate of 10-12 per cent".[1/] It is of some importance whether 1976 is seen as a temporary abberation in otherwise continuously rapid growth, or whether there is indeed a detectable loss of momentum in industrial

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1/ IBRD, Malawi: The Development of Manufacturing, Report No. 3460-MAI, May 8, 1981, p. v.

development after 1975, inviting the question already raised of how much 'steam' there is left in the resource-based industrial strategy. The facts will become clearer when revised figures are available for value added in manufacturing at constant prices for the years after 1979. Even then, it would be inadvisable simply to project the growth rates up to 1976, or up to 1982, into the 1980's. The prospects for the 1980's must also be assessed after scrutiny of specific industrial project possibilities and examination of the resource base now existing in each of the different sectors of the economy, which is the subject of the present study. Thus following the tobacco boom, it has been particularly the expansion of sugar production which has carried manufacturing value added forward, a boost which cannot be projected forward at historical rates.

2.3 The expansion of manufacturing employment (Table 2.3) and the effect of wage policy on this will be discussed presently. If we examine the structure of manufacturing, we find that about 61 per cent of manufacturing value added and 77 per cent of employment was in agro-processing, including forest products: covering food and beverages (particularly sugar), tea, tobacco, textiles and leather, and wood and wood products (Table 2.4).[1/] The importance of domestic natural resource-based manufacturing will be larger than this since, for example, non-metallic minerals will induce domestic resources. The difference in the percentages demonstrates the high labour-intensity of agro-processing compared to other types of manufacture. This composition therefore is likely to explain a significant part, though not necessarily all, of the labour-intensity which is a feature of Malawian manufacturing activity.

2.4 About 70 per cent of the increase in manufacturing value added over the period 1973-79, similarly, was in agro-processing and wood products, tobacco, sugar and beverages being the most important items, followed by textiles and, outside this category, non-metallic minerals. About 74 per cent of the increase in manufacturing employment was in the same category. This confirms the statement that Malawi has been pursuing a policy of resource-based industrial development.

1/ Tobacco, tea and sugar processing together account for about 40 per cent of sales and employment.

2.5 As indicated in Chapter I one distinct element in Malawi's development policy has been its policy towards wages. The National Wages and Salaries Policy introduced in 1969 aimed at restraining wages in order to expand employment opportunities by encouraging the adoption and maintenance of labour-intensive techniques in manufacturing, and the use of estate labour. Thus any employer who wishes to increase his firm's general level of wages by more than five per cent in a year was obliged to apply to the Wages and Salary Restraint Committee for approval.

2.6 This policy has been commended by a number of observers, and it is possible to argue from available statistics that there has been a positive response in the form of wage employment increases. Comparing wage employment increases for 1973-76, for instance, with changes in monetary GDP by sector for the same period, we obtain an employment elasticity exceeding unity overall, and approaching two for manufacturing (Table 2.5). Comparing changes in real value added with changes in employment, however, we obtain an employment elasticity of only 0.76 for the years 1968-77 and although the overall elasticity for 1977-79 is as high as 1.13 the data shows erratic variation between sectors, with that for manufacturing equal to only 0.47 (Table 2.6).

2.7 Again, if calculations are made using the recently revised data on manufacturing value added (Table 2.7), one finds an overall elasticity of 0.38 for 1973-75 (very low) and 2.55 for 1975-79 (very high). This suggests one whould be wary of calculating the elasticity for a short period of two years and when the rate is derived from a rather heterogeneous aggregate, the composition of which is changing. Even the figure of 0.82 for 1973-79 is too much the resultant of very different figures for individual industrial groups for one to identify the consistent effect of low wage rates, and is in any case not particularly high. If this is true for specific value added data, it must be more so for data relating to monetary GDP as above. Great care should be taken, therefore, in drawing conclusions from employment elasticity data about the positive effects of wage changes on employment. Further reasons to be cautious in ascribing beneficial effects arising out of the low wages are discussed later.

2.8 Some other characteristics of manufacturing in Malawi are worth mentioning. Because of the important share of agro-industrial processing in the total, activity in manufacturing is also subject to seasonal variation in line with agricultural cycles.

2.9 As regards location, there are some opposing forces. Resource-based activities such as tea, tobacco and sugar processing are distributed across the country according to the agricultural areas involved. On the other hand the rest is heavily concentrated around Blantyre, which has the attraction of main market, urban labour supply, infrastructural facilities and the usual factors tending to produce cumulative concentration of industry. Two major aspects of policy which may help to combat this tendency to polarisation are the establishment of the capital city at Lilongwe, in the centre of the country, together with associated attempts to encourage location of new industries there, and a reasonably positive attitude towards small and informal industries in Malawi, such as tailoring and brickmaking, which are spread throughout the country. The importance of rural industry in this respect is shown by the fact that, in 1976 for example, 60 out of 69 per cent of employment in manufacturing located in Malawi's four main towns was based in Blantyre, and redistribution away from Blantyre was largely accounted for by the 31 per cent located in rural and small urban places (Table 2.8).

2.10 The contribution of small and informal sector industry is discussed in Chapter IV. Examination of the size distribution of industrial plants (Table 2.9) shows that there are a handful of large plants employing 1,000 or more persons and a somewhat larger number employing 500 or more. Nearly 60 per cent of plants in the official statistics employ less than 40 people, and 40 per cent less than 10. Even so this omits large numbers of very small 'enterprises', such as tailors working on their own account, which if included would greatly outnumber all establishments included in the statistics.

Among construction companies (Table 2.10) the position is similar, with about 10 large firms and 33 per cent of firms with below 10 employees: again there is probably substantial omission of small, informal sector enterprises. Within the industrial sector the biggest plants, employing 1,000 persons or more, are in tobacco (three plants), sugar, textiles and cement, while among others employing 500 persons or more are tobacco, tea, beverages, clothing, sawmilling, soap making, grain-milling and printing and publishing. Nearly all of these are resource-based industries, mostly in agro-processing.

2.11 The manufacturing 'export industries' which account for a 20 per cent weight in the Index of Industrial Output, calculated for 1970=100 (Table 2.3) are in fact predominantly agro-processing of tea and tobacco, while the surge in the index for Food, Beverages and Tobacco under 'Consumer Goods Mainly for the Domestic Market' is due especially to increases in the volume and value of sugar refined.

2.12 Despite the emphasis on private enterprise and on encouraging foreign investment, the main vehicle for industrial development in Malawi, as in a number of other African countries, has been a number of parastatal companies, though there are also a few large foreign-controlled firms. These parastatals are particularly involved in agro-processing and indeed, also participate in estate agriculture in a major way.

2.13 The most important parastatals are (i) the government-owned Malawi Development Corporation (MDC); (ii) Press (Holdings) Ltd., which is technically a private company but with shares held in trust by His Excellency the President for the people of Malawi, and thus in effect a parastatal; (iii) the Agricultural Development and Marketing Corporation (ADMARC), which acts as a marketing board but also participates in manufacturing in the area of agro-processing; (iv) the Import and Export Company of Malawi (IMEXCO), engaged as its name suggests in both sides of foreign trade, owned by 51 per cent by MDC and 49 per cent by Press; and (v) the Industrial Development Bank (INDEBANK), which is owned 22.25 per cent each by ADMARC, CDC, DEG (The Deutsche Gesellschaft fur Wirtschaftliche Zusammenarbeit of West Germany) and FMO (the Nederlandse Financierungs - Maatschappkj voor Ontwikkelungslanden N.V.), with 11 per cent by the IFC.

2.14 Press and MDC are operational holding companies involved directly in managing subsidiary companies as well as having financial interests in associated companies. ADMARC and IMEXCO are first and foremost trading companies, but ADMARC has considerable holdings in a range of agro-industrial enterprises, some of which it manages, while IMEXCO has an interest in several industrial enterprises. INDEBANK is a traditional development finance company.

2.15 MDC and Press, and also ADMARC, frequently combine to hold shares in the same company, so there is very much a network of connecting interests covering a substantial apart of Malawi an industry . This is accentuated by the fact that MDC, Press and ADMARC have controlling interests in the two commercial banks in Malawi. The detailed pattern of investments by Press Holdings is not readily available, but a good picture of the extent of joint participation involving two or three of the corporations is obtainable from the Annual Reports of MDC and ADMARC (Tables 2.11 and 2.12). It may be noted also that ADMARC in 1981 had outstanding some K37 million in unsecured loans, much more than the value at cost of shares held, at K25 million, and debentures, etc., of K1.77 million; and that 29 of the K37 million was with Press Holdings. It should be noted that these investments are all into medium or large-scale enterprises, as are those of INDEBANK and, for the most part, the commercial banks, so that the flow of capital is very much internalised within this sector.

2.16 In general the parastatal companies within Malawi appear to be well managed, according to sound commercial criteria, without implying that there is no problem of developing high-level Malawian managerial and technological manpower. If anything, the criticism should be the opposite one, that policy has erred on the conservative side, with investments concentrated in the safest areas where financial success is not difficult to achieve and that a stronger developmental role should be accepted, even if this is constrained by the need to attract private investors into participation. For example, the MDC Annual Report for 1979 shows that the total of profits before tax for all the MDC companies, subsidiary and associated, was just under K16 million (K15,982,397). Of this 75 per cent (K12,062,532) came from just four enterprises, the Commercial Bank

of Malawi (shareholding MDC 20, Press 40, ADMARC 10), Carlsberg (Mwi.) (MDC 27, Press 24), David Whiteheads (MDC 29, Press 20) and INDEXCO (MDC 51, Press 49). These areas, including the mass consumption goods of beer and cotton fabrics, foreign trade and banking, are 'rock solid' areas for investment, while Press have other investments such as in popular newspapers and in a network of departmental retail stores throughout the country, as well as large-scale estate agriculture, which offer comparatively safe sources of profit. Similarly, although a great deal of success has been had through these corporations in attracting foreign investment, this has, again, been particularly in safer and relatively lucrative areas. This may be problematic once the most obvious resource-based activities have been developed, and it is necessary to push risk capital into a more developmental role. The associated problem which exists is that of channelling finance into small-scale and rural activities, given that such a large portion of the available finance being created in Malawi is internalised in the manner described. Even ADMARC which derives most of its accumulated profit from smallholder farm produce limits its industrial activities to medium and large-sized firms.

CHAPTER III

RESOURCE AVAILABILITIES

3.1 Mineral resources[1/]

3.1.1 Malawi, unfortunately, does not appear to be well-endowed with high-valued mineral resources. Mineral occurrences are generally small in quantity and 'not of obvious commercial interest'[2/] due to the smallness of the deposits and the costs of transport to export markets. It does not appear likely, for instance, to join the ranks of the oil-producing developing countries. Exhaustive investigations have not been carried out, but an evaluative study[3/] carried out in 1980, based on general geological considerations, was pessimistic and argued that low probability geological hypotheses did not justify embarking on any expensive petroleum exploration programme. However further investigations are being made, and Shell have carried out airborne reconnaissance over Lake Malawi.

3.1.2 Coal has been found in the Karroo sediments of Malawi, particularly at Ngana by the Songwe River in Karonga District, Northern Malawi. The Western section is estimated to contain some 7.1 MT of run-of-mine coal. Further quantities of 1.2 MT and 2.7 MT are estimated in the nearby Lufira and Kibwe Karroo basins respectively, these to a depth of 30 m. There is, however, a possibility of extensive coal reserves being concealed beneath the lakeshore plain north of Karonga, coal having been intersected at deptn at Lufira. Raw coal reserves of 24 MT have been inferred in the Livingstonia Coalfield further south, while other Karroo basins containing some coal are Hara, North Rukuru and Nathalire.

1/ This section draws heavily upon R.R. Mamu and M.J. Crow, Minerals and Mineral Resources of Malawi, Report RRM/18 MTC/16, Geological Survey of Malawi, Zomba, June, 1980 and Annual Reports of the Geological Survey Department.

2/ Mamu and Crow, loc. cit.

3/ A. Dumestre, exploration consultant, Evaluation of petroleum production possibilities in Malawi, U.N., March, 1980.

3.1.3 Interesting as these finds are for the future, they are of much less immediate economic interest. This is so first because they occur in the more remote areas, necessitating expensive infrastructural investments in roads (in areas of labour scarcity) and occurring in that part of Malawi where industrial demands for energy are limited. The Ngana project would require investment of more than K100 million. Secondly, there is the alternative energy source of hydro-electric power. While coal would be expensive in the extreme to transport to the industrial area around Blantyre, electricity is cheap to transport to the north, once the transmission lines have already been established. Cheap, open-cast methods of mining to provide limited amounts of coal locally in the north may be worth pursuing. Since most of the deposits are not suitable for open-cast mining, however, the possibilities for small-scale shaft mining should be explored. A Japanese study concluded that tunnel-mining could produce coal at 40K per ton. It would certainly be desirable to replace coal imports which in 1980 amounted to 74,000 tons valued at nearly K4 million.

3.1.4 Some coal occurs in the south in the lower Shire Valley, but investigations of the unfaulted portions of the Sumba-Nkombezi coalfield showed the coal to be thin and with high ash content. Drilling in the Chiromo coalfield in 1923-28 had long ago found coals there to be of poor quality, limited extent and severely faulted. There remains a possibility of a concealed extension passing beneath the Shire Valley sediments.

3.1.5 No significant deposits of iron ore are known to exist: deposits at Mindale Hill, north of Blantyre are estimated at 0.16 MT in a banded hematite magnetite gneiss to a depth of 10 m., and those near Dronze Mountain, south of Ntcheu, at 0.05 MT. Apatite occurs as an impurity in both deposits. Iron sulphide exists, with potential for sulphuric acid production, but demand for this hinges on the existence of the pulp project, for which prospects do not appear good.

3.1.6 Bauxitisation of syeno-granitic rocks has produced a deposit of gibbsite (alumina tribydrate) associated with kaolinite on the Lichenya plateau of Mulanje Mountain. Total reserves amount to about 29 MT, with an average bauxite composition of 44 per cent. The deposits are rather inaccessible and not likely to be worth exploiting until market and transport factors become more favourable. Additional minor occurrences of bauxite exist on the Zomba-Malosa massif and on the Nyika Plateau.

3.1.7 Uranium is known to be present in a number of places in the Karroo sandstones of northern Malawi, particularly in the North Rukuru basin and perhaps also at Livingstone and west of Karonga. Uranium mineralization exists also in the Thambani area, in Mwanza District, and uranium-pyrochlore in the Ilomba Hill area, within pyroxinite bodies. The latter has some potential as a by-product of niobium extraction. An investigation carried out in 1980 by the U.K. Institute of Geological Sciences yielded a consultancy report entitled 'An Evaluation of Uranium Potential of Malawi', which has prompted several enquiries from mineral companies.

3.1.8 A significant deposit of strontianite (strontium carbonate) together with low thoria monazite (a rare earth mineral composed mainly of ceria and lanthana here) has been identified at the Kangankhunde carbonatite complex south of Balaka. Ore reserves of between 0.4 and 0.46 MT are indicated. Further deposits of monazite rich in thorium occur in several beach sand areas of Lake Malawi. A feasibility study by Lonrho suggests that exploitation of the monazite for export may be just economic. Small quantities of vermiculite for export, about 30,000 tons per annum, have been developed at Mwanza by British Gypsum. Operations are likely to be extended.

3.1.9 Phosphates would have obvious value in resource-based development as fertilizer raw material. It occurs in Malawi in the form of apatite in the Tundulu carbonatite complex in Mulanje District, where drilling has indicated reserves of some 1.25 MT. Beneficiation tests have been carried out at the Warren Spring Laboratory in Britain. Unfortunately the consignment tested proved to be of low grade, contaminated with iron and carbonates, and not amenable to standard flotation techniques. Further studies have been suspended for the time being. Other deposits occur in eluvial soils at Chingale, south-west of Zomba, and at Malindi.

3.1.10 Substantial quantities of kyanite, used in making refractory bricks, have been identified in gneisses at Malingunde and at Kapiridumba, south of Ntcheu. The latter deposit was formerly worked between 1952 and 1954, when 2,630 tons of kyanite were produced. Substantial reserves of graphite exist near Ntchisi with possibilities for small-scale exploitation, and there is fluorite, including deposits of over 2,000 tons within 30 metres of the surface in the Chilwa area, and diatomite, extensive areas occurring in the south-east arm of Lake Malawi and north of Cape Maclear.

3.1.11 A variety of other metallic minerals have been identified. Niobium minerals include pyrochlore, betafite and columbite. Titanium minerals (rumite and ilmenite) occur mostly in alluvial/eluvial deposits, and are thought to exist in potentially commercial quantities. Barites is common in the carbonatite complexes at Kanganknnde and Tundulu. Minor occurrences of metallic minerals are of copper, lead, manganese, magnesite and chromite.

3.1.12 Traces of gold have been found in many parts of the country and minor working of alluvial gold has been carried on in the Lisungwe valley over many years. Alluvial gold in the Unga river has attracted some interest. A variety of ornamental stones exist in Malawi, offering potential for some small-scale craft industry in the future. A yellowish-green corundum occurring near Ntcheu was worked as gem corundum during 1967-70, while a dark red ruby corundum occurs at Likudzi, also near Ntcheu. Other stones include agates, beryl, smoky quartz, in large quantities, blue sodalite, with ornamental and amazonite, both varieties of feldspar.

3.1.13 Marble and limestone are quarried at Changalume, near Zomba, for the manufacture of Portland cement in Blantyre, with the addition of imported gypsum. This represents easily the largest mining and mineral processing operation in the country at present. More than 100,000 tons of cement per annum are produced, largely used for the production of brickwall and plaster mortar, entirely for the domestic market. Reserves of low magnesia marble bodies, amounting to an estimated 10.8 MT exist at Mayeka, north-east of Kasungu, and could be the site of a second cement plant in Malawi. As explained presently, the immediate constraint is on the demand side.

3.1.14 In addition an important potential market exists in Malawi for lime, at present imported for use in the sugar industry. Imports in 1980 amounted to some 2,400 tons, costing over K½ million. The sugar industry in Malawi, however, does not regard the local lime at present as being of sufficiently good quality for its purposes, so that there is a need to improve production methods if this market is to be secured. Secondly, in a cement mix for brickwall and plaster mortar lime can be substituted for cement up to a ratio of 15 or 20 per cent with improvement of quality, implying a market in Malawi of some 15,000 to 20,000 tons per annum.

3.1.15 Marble bodies suitable for lime production occur in several

parts of Malawi, and some of these provide the basis for some local small-scale production. One of the largest bodies is that forming the Chenkumbi Hills near Balaka, where variable quality dolomitic marbles are burnt for lime. Some 0.3 MT of good quality calcium carbonate marble low in silicate has been identified at Malowa Hill. A number of other small concerns exist, mostly in the Southern region, at Lirangwe (producing 300 tons of lime per annum), Kholombizo-Matope (producing over 150 tons per annum from reserves of about 0.65 MT). The need for assistance to these is discussed later.

3.1.16 Interest exists in Malawi in establishing a ceramic industry making potteryware and other ceramic products. Kaolinite and kaolinitic clays have been found in an area south-east of Lilongwe, and preliminary investigations suggest that large quantities of suitable clay might be present. Other deposits of kaolinitic clay occur in several places in the Ntcheu area, including one very accessible one containing more than 0.1 MT. Substantial quantities of kaolinite are known to exist also in the Mongolowe Hills, though these are not yet fully assessed.

3.1.17 High-silicate glass sands were discovered in a number of dambos in 1978. Reserves of good quality glass sands were put in 1980 at some 720,000 tons, in six dambos, but it is now considered that at least one million tons of deposits exist. Other extensive sands on the Lake Chilwa sand bar are conveniently situated next to the railway, but unfortunately are less suitable due to high iron content. The establishment of a glass industry is being actively pursued, as will be discussed.

3.1.18 Extensive deposits of nepheline syenite exist in several parts of Malawi: in the Mongolowe hills, at Junguni Hill (north of Zomba), at Songwe Hill (north of Mulanje), at Ilomba Hill, and in the Rumphi, Mpompha and Chikangawa igneous complexes.

3.1.19 Nepheline syenite has a wide range of possible industrial applications, as a filler for plastics, rubbers and paints, as an aggregate, and in the manufacture of sodium carbonate, fertilizer, aluminium, glass and porcelain. The most important applications are in glass and ceramics, where there is Malawian potential, and as an enamel filler.

3.1.20 However these possibilities depend entirely on the chemical composition and nature of the minerals present in the syenite. For ordinary flint glass, for instance, the iron content must be no more

than 0.06 per cent (somewhat higher for coloured glass). Hence industrial application is limited to those deposits in which the iron-bearing accessory minerals can readily be removed.

3.1.21 In addition there is the question of market. There is some potential to reduce future imports of soda ash for glass making, as already mentioned, if the chemical composition proves satisfactory. This leaves a comparatively small market within Malawi, possibly of less than 2,000 tons per annum which would probably not by itself justify mining and beneficiation of the raw material. This raises the question of export possibilities, which are thought to exist in Zambia, Zimbabwe, Mozambique and Tanzania. Apart from vast quantities processed annually in the U.S.S.R., the two major world producers for export at the moment are Canada and Norway, with Canada responsible for about threequarters of the combined total for these two. The development possibilities for nepheline syenite thus require technical assessment of the chemical composition of deposits and their extent combined with economic assessment of markets and delivery costs.

3.1.22 One of several industries of significance in Malawi which tends to escape full attention in part because it is composed of small-scale enterprises, is traditional brick-making. Alluvial and residual clays suitable for use as brickclays are widespread in Malawi and offer scope potentially for considerable development of this industry, as will be discussed presently. Substantial areas have been identified specifically to serve the expanding market of the capital city at Lilongwe.

3.2 Agricultural resources

3.2.1 Despite the important contribution which can be made by clays and other non-metallic mineral products, the fact remains that on the basis of evidence available up to now Malawi is unfortunately not endowed with deposits of hign-valued minerals such as the diamonds or copper of other Southern African countries which might either provide the basis for mineral-linked industries or provide a source of abundant capital and foreign exchange to use in promoting industrial development in general. This means that even more than otherwise Malawi must look to the agricultural and natural resource sectors to provide for the immediate needs of the people and the springboard for complementary industrial development. This emphasises the argument which will be made here for an agricultural development strategy which will be appropriate for this purpose.

3.2.2 In fact much of the rapid growth in manufacturing value added in Malawi up to 1976 reflects directly the expansion of agriculture, and with it agro-processing. Much of the growth came in tobacco production, and most of this from estates. The value of tobacco sold increased almost ten-fold over the period 1969-77, and the volume almost four-fold (Table 3.2.1). Dramatic falls in tobacco prices in 1978 reduced the value of sales by 1980 by 34 per cent from K89 million to K59 million, although the volume of output actually increased, despite a large number of bankruptcies among smaller estates. Sharp rises in price in 1981 have done much to restore the balance.

3.2.3 A positive feature has been the steady expansion throughout of burley production which increased by 80 per cent in quantity after 1977.

3.2.4 The key questions that need to be raised with respect to tobacco, and which are discussed later, are, first, what can be done to safeguard existing production in the face of increasingly critical fuelwood shortage and, secondly, what can be done to increase smallholder participation in production.

3.2.5 The most important crop in Malawi is, of course, not tobacco but maize. This accounts for the 'lion's share' of area under crops, some 78.5 per cent (Table 3.2.2), being the staple food crop of the population. Most of this is processed, moreover, into maize flour, although the value added in processing this huge maize crop is under-

estimated by using local prices for processed and unprocessed maize, rather than import parity. Processing is involved in the vast quantities of maize consumed directly by the producing households, in maize marketed locally at the village level, and in maize sold to ADMARC. The latter sales stagnated up to 1976, due to the unfavourable pricing policies pursued, but more than doubled between 1976 and 1981 (Table 3.2.3), a significant part of this no doubt representing a net increase in the adoption of maize as a cash crop following the improved prices offered.

3.2.6 Apart from its direct significance, maize is important because of the land area it occupies at the expense, potentially, of other crops, maize being highly 'land-intensive'. The need to satisfy the staple food demands of an increasing population while at the same time releasing land for other crops is considered later.

3.2.7 Groundnuts constitute an important element in the national diet. About three-quarters of output is consumed on-farm, but substantial quantities are sold to ADMARC. The average level of purchases by ADMARC, in volume terms, is substantially down since the first half of the 1970's: average purchases 1977-81 are actually 36 per cent below those for 1972-76. The bulk of the output is of the high quality Chalimbana variety used in the confectionery trade, and therefore more likely to be exported as nuts than supplied to processing industry.

3.2.8 While tobacco production suffered setbacks towards the end of the last decade, an important new stimulus to the economy in the second part of the 1970's, and into the 1980's, has come from sugar production which in Malawi, again, is an estate crop. The two major sugar-producing estates are SUCOMA in the Southern Region, responsible for the initial growth of the industry, and more recently the Dwangwa Sugar Estate in the Northern Region, also managed by Lonrho. Each has its own processing plant for refining sugar. Output increased from 49,000 tonnes in 1974/75 to 93,000 in 1978/79, an 89 per cent increase (67 per cent increase in area). Output thus tripled in the six years between 1974/75 and 1980/81 (Table 3.2.4). Output in 1981 increased still further to 166,000 tonnes. Further expansion will depend on the availability of export markets or the establishment of an ethanol plant.

3.2.9 Cotton is a crop that deserves maximum attention in Malawi, being a smallholder crop that has been very successfully grown in different parts of Africa. It is grown by some 100,000 small farmers but unfortunately within a relatively circumscribed area, in the Lower Shire Valley. Since 1970, however, there has been no trend increase in the volume of output, ADMARC purchases in 1981, for instance, being somewhat less than those in 1972 (Table 3.2.3). Likewise in 1977 the number of growers was only 6 per cent above that in 1965 and was 21 per cent below the peak number of 1967, ten years earlier (Table 3.2.4). Over the same ten-year period hectarage declined by 33 per cent. Price policy has undoubtedly contributed to this stagnation in production, as will be discussed again later. If this is revised, there could be a significant response. The expansion of the crop in the Central Region during the period mentioned is one positive factor, and long term world price prospects are good. Apart from the need to offer cash crop opportunities to small farmers cotton is a crop which already has had important forward linkages into industry as well as having possible backward linkages.

3.2.10 Tea is largely an estate crop in Malawi. Despite relatively good management, the rate of return is much lower than for tobacco.[1/] Production in Malawi increased from 16.9 million kg. in 1969 to 31.6 in 1977, an 87 per cent increase, but has remained stagnant since that time. World Bank commodity projections suggest that in the long term prices will fall below even the present depressed levels so that while smallholders might still find it profitable to come into tea, given the shortage of other opportunities, estates are more likely to diversify away from it. Overall, not much expansion of output can be expected.

3.2.11 Coffee is not a major crop in Malawi, extending in 1979 over only some 560-570 hectares, most of this in the north. Coffee probably represents one of the big missed opportunities in Malawi, given that coffee was originally introduced on estates in the 1890's and covered an area as large as 6,900 hectares in 1901. Yet smallholder

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1/ About 12 per cent on equity after taxes in 1976, according to IBRD, Agro-Processing Report, 1979, p. 42.

coffee, of the Arabica type, so successfully grown by smallholders in other parts of Eastern Africa, was introduced only in the 1930's, reaching a peak of 730 hectares in 1972. The possibilities have been belatedly realised with the establishment of the Smallholder Coffee Authority, responsible for an extensive coffee improvement project centred in the north, which is scheduled to generate an additional 690 hectares of coffee, as well as increasing yields. This will generate a corresponding volume of processing, though perhaps not of processing facilities, pulperies in the north at present operating substantially below capacity.

3.2.12 Rice is a smallholder crop in Malawi, with production in many areas, but especially in the south, under irrigation in the Shire Valley, and in the northern region, particularly the Karonga lakeside plains. About half the crop is consumed on-farm. There is some confusion over the economics of the crop which require further assessment. Calculations made by a World Bank group suggested (Table 3.2.5) that the ADMARC producer price in the north at leas was substantially in excess of export parity in 1977.[1/] This is at variance with a comparison of a 1980 farm gate price paid of about K100 per ton and a 1979 economic price of K296 and above for southern irrigated rice, a comparison made in the National and Shire Irrigation Study.[2/] Pricing policy is blamed for the stagnation in production. Sales to ADMARC expanded from about 20,000 tonnes in 1972 to nearly 31,000 in 1978, only to fall sharply again to under 15,000 in 1981 (Table 3.2.3), probably due to diversion into unofficial markets. Given the need to intensify agricultural production in Malawi, rice is an attractive crop if the capital costs of irrigation in the south and transport costs for shipping rice from the north are not too great a disadvantage, and plans are going ahead to boost production.

3.2.13 Malawi has a rubber estate near Nkhata Bay, the only rubber estate, in fact, in Eastern and Southern Africa. The trees were originally planted in the early 1900's by a company, the African Lakes

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1/ IBRD, The Development of the Agricultural Sector, 1981, Table 50.

2/ National and Shire Irrigation Study, Final National Report Annex G, Ministry of Agriculture and Natural Resources, December, 1980.

Corporation, but has been re-opened comparatively recently, in 1972, by Mandala Ltd., which has been progressively replanting the old stands with higher yielding varieties now beginning to produce rubber. Development and processing plans are discussed in Chapter IV.

3.2.14 One promising new crop which has been developed quite recently in Malawi is guar beans. Introduced in the Shire Valley in 1976, output has increased quickly from 28 tons in 1976 to about 3,000 tons in 1978, when there were about 8,000 registered growers with a combined area of 3,042 ha under the crop. An important advantage is that it is a smallholder crop, introduced in an area (south of Bangula), moreover, which did not previously possess an export crop. It is thought that as much as 20,000 tons could be produced and that the beans could become a major source of cash income for the 10,000 or more farm households in the area. Whether there is scope for expansion beyond this needs investigation. Guar gum at present produced in the U.S.A. is proving very profitable.

3.2.15 Malawi has attempted to encourage the growing of cashew nuts, both by estates and smallholders. The neighbouring countries of Tanzania and Mozambique are the two largest world producers of what is an important cash crop in those areas. The recent IBRD evaluation did not comment very favourably on the prospects for cashew, particularly as a plantation crop. Not only are growing conditions in the largest developed area, under ADMARC at Mangochi, near the southern end of the lake, not very favourable, but Tanzania and Mozambique, where production relies on low-cost collection by smallholders from wild growing trees, are likely to have a cost advantage. There may be more scope for smallholder production although there is an additional transport disadvantage (production in the other countries is in the coastal areas). Also, pressure on land in Southern Malawi precludes the development of a very great concentration of trees, sufficient to feed a processing plant, whereas there are economies of scale in processing, already attained in the other countries. Nevertheless the production possibilities, and the scope for processing in Mozambique, need to be considered. Press have identified a potential area of suitable land amounting to 4,000 hectares near Salima.

3.2.16 Where Malawi has a special opportunity is in the production of macadamia nuts, a highly priced 'luxury' confectionery nut. The

introduction of the nut into Malawi in the mid-1960's and its subsequent development has been carried out with close control over varieties, so that a uniform high quality product is now obtainable. Though the crop has been taken up in a number of other places over the last fifteen years, including California, several countries in Central America and some in East and Southern Africa, in addition to Hawaii, the main world producer, Malawi has acquired a very useful lead in the development of the crop. A particular advantage, as a high-valued crop in relation to weight, is that the nuts will be able to stand airfreight costs to Europe or elsewhere, so that Malawi's geographical position will not prove an unsurmountable obstacle.

3.2.17 At the beginning of 1979 about 1,500 acres (625 ha) of macadamia orchard was registered with the Tree Nut Authority including 225 acres on the Naming'omba Tea Estate, where a factory also serves outgrowers, and a 500-acre ADMARC estate near Mzenga, and a certain amount of smallholder production. One important question is whether further expansion should be based on estates or smallholders, or some mixture involving outgrowers. There is a strong reason for this to be planned on the basis of either of the last two options because, apart from the need to offer more cash options to smallholders, the frequent harvesting required, and labour intensity, makes this a very suitable commodity for smallholders, so long as they have access to processing.

3.3 Livestock resources

3.3.1 The numbers of cattle in Malawi are limited by the pressure of population and requirements for arable land on grazing in the south, and by the highland nature of much of the north, though it is there that the greatest amount of available new grazing remains. In 1977 there was nationally an average of only 0.13 cattle per head of population and about the same number, only, of sheep and goats (Table 3.3.1). The number of cattle per head of population in the Southern Region was only half that, while the ratio in the Northern Region was five or six times as great. Nevertheless the numbers of cattle have been increasing, very rapidly in the south, at an annual rate of over 8 per cent and nationally at nearly 5 per cent per annum, well in excess of the growth of human population. The rapid growth rate in the Southern Region has increased that region's share of the national cattle herd from 19 per cent in 1969 to 26 per cent in 1979, although it is the Central Region which still holds the largest numbers of cattle, nearly 50 per cent of the total. The numbers of sheep and goats have not been increasing very much, the annual rate of less than one per cent implying a fall over time in the numbers of sheep and goats per head of population. The number of pigs, on the other hand, has been growing at a very satisfactory rate, 2.8 per cent per annum over the decade, although the estimated numbers fluctuate.

3.3.2 However land scarcity in the south is likely to limit future expansion, unless stallfeeding of cattle, with 'zero grazing', can be developed. Overgrazing is already noticeable in some areas due to the increase in cattle numbers. At the same time meat is generally in short supply in Malawi and the position is one of excess demand. There is greater availability in the rural areas than in the towns, as buoyant rural demand restricts the level of deliveries to the urban abbatoirs. The consumption per average urban dweller is estimated at only 9 kg. per annum. Population growth at the current high rates will make it difficult to prevent excess demand increasing over time for both meat and dairy products.

3.3.3 The extent to which this happens will depend on the degree to which production can be intensified. This will involve the animal feed industry, as discussed presently. Unfortunately, as far as animal production is concerned, this is not an activity in

which a great deal of progress has yet been made.

3.3.4 A stallfeeder scheme for smallholders to produce beef has been instituted, under which 3,500 head were fattened in 1978. On the face of it, it appears surprising that this has been directed towards beef rather than milk production: stallfeeding appears expensive if the animal is to be slaughtered rather than used as a 'capital good' for converting a constant flow of feed into one of milk. While this may be a fair response to the serious shortage of meat, the economics of the scheme requires careful scrutiny.

3.3.5 The market for milk, certainly, is vastly undersupplied, and there is high potential demand for cheese and other dairy products. A smallholder dairy programme has been in operation for some time and by 1980 had increased to some 500 small farm units within the urban zones, with about 1,000 cows, crossbred Zebu and Friesian. In addition a mixed farm estate with a 250-cow dairy herd has been established in the south under a Canadian programme, with another planned for Lilongwe.

3.3.6 The numbers of sheep and goats, if the published figures are at all accurate, are not increasing in line with population. They are used to augment meat supplies in the rural rather than urban areas, and there appears to be a general preference for beef, just as there is for meat over fish, despite the large volume of fish consumed. Nevertheless, given the need to supply meat and milk products particularly to poorer rural households with small holdings and limited cash income, the possibility of achieving a wider distribution of goats might be considered. For the same reasons the promotion of poultry would seem to deserve high priority, in the south of the country at least.

3.3.7 Sheep in Malawi are not of the wool type. However a feasibility study exists for a GTZ woolsheep project in the north, awaiting implementation. Scope exists for grazing within the forest areas of the north, particularly with strip afforestation. If woolsheep could be developed, the wool could be supplied as an input to the Knitwear factory which already exists.

3.3.8 From what has been said, it is apparent that Malawi is not the most obvious country in which to develop animal-based industries, when other economies with substantial livestock sectors such as Botswana or even Tanzania are considered. The priority is to increase the supply of meat and dairy products for both urban and rural consumption, through the intensification of beef and dairy cattle rearing and the promotion of goats and poultry. Nevertheless there is a significant national herd, and corresponding output of hides and skins, so that other industrial possibilities exist, as considered later.

3.4 Fisheries resources

3.4.1 Twenty-two per cent of the surface area of Malawi is water, distributed in such a way, geographically, as to maximise the proportion of the population within potential service distance of the fishing resource. In addition to Lake Malawi itself, other shallow lakes, Lake Malombe and the Upper Shire Valley, Lake Chilwa and Lake Chiuta, nearer the more heavily populated rural and urban areas, are major sources of fish. Between 70 and 80 per cent of animal protein consumed in the country is fish. In 1973, for instance, annual per capita consumption of fresh fish was estimated at 3.9 kg. and of dried fish at 10.5 (fresh fish equivalent), a total of 14.4 kg., compared to 3.3 for meat and 0.7 for poultry.[1/] The significance of this increases in proportion to the lack of prospects for animal production: signs of overgrazing by cattle are already apparent in the far south and far north of the country, while land availability for grazing is rapidly diminishing, and increasingly pre-empted by the demands of intensive subsistence and cash crop agriculture. At the same time per capita consumption of animal proteins is still well below WHO recommended figures, so that there remains an urgent need to increase output. A specific advantage, also, is that fish represents a relatively cheap form of main dish[2/] compared to meat, for low-income rural and urban households.

3.4.2 Fishing also constitutes an important form of employment in Malawi and needs to be viewed alongside agriculture as a basic production activity. Indeed a large number of rural households are farming/fishing families rather than simply farmers. For this reason estimates of the number of fishermen are intrinsically difficult, though rough figures issued by the Department of Fisheries are 21,000 in 1979 and nearly 23,000 in 1980, including assistants. Some 70-75 per cent of these may be effectively full-time.

3.4.3 Certainly it can be said that a large number of households obtain significant incomes from fishing, and data available from the

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1/ E. Thomson, M. Cameroon and A. Jackson, Food and Nutrition Programme for Malawi, A Report of the F.F.H.C. Nutrition Team, 17 July, 1973 to 15 January, 1974.

2/ Protein requirements can be fulfilled from non-animal sources but meat, poultry and fish are desired as main dish complements to starchy staples independently of protein content.

Agro-Economic Surveys show that some of the relatively well-off rural households derive their superior position from fishing income. Moreover, considerable income is generated in the processing of fish and in trade. At the same time fishing is valuable as an activity which has been carried out very effectively through small enterprises and indeed in Malawi remains largely artisanal, thus ensuring a wide distribution of the incomes created.

3.4.4 Current output is of the order of 70,000 metric tons per annum of landed fish, most of this (about 90 per cent) produced by artisanal fishermen. Malawi has five major fisheries: Lake Malawi; Lake Malombe and the Upper Shire River; Lake Chilwa; Lake Chiuta; and the Middle Lower Shire. In addition there is some embryonic fish farming development. Table 3.4.1 shows the evolution of total output and relative importance of the different sources: Lake Chilwa (32 per cent) is almost as important a source as Lake Malawi (46 per cent), which is responsible for less than half the total output.

3.4.5 While output has not been increasing, due to other factors, the number of fishermen have probably continued to increase (until losses of boats in recent years, due to flooding). The number of traditional boats in 1978 was estimated at 9,026, compared to 7,535 in 1975, an increase of 20 per cent.

3.4.6 In addition to the lake fisheries, over a thousand small fish farm units are reported to exist, mostly in the south, though these still contribute only a fraction of total output.

3.4.7 As regards development potential, the general view is that in the southern part of the lake and other southern fisheries fishing is close to its maximum sustainable yield. Some scope exists in the central part of Lake Malawi, especially through mid-depth trawling activities. The stocks of fish in the deep northern section of Lake Malawi are not known (a programme for assessment is underway) but are probably limited. Moreover rough water makes fishing difficult, particularly any kind of artisanal fishing, and the most common types of fish differ. Some research and development is being carried out by the Fisheries Department, with U.N. assistance, on intermediate methods of fishing suitable for the central and northern lake.

3.4.8 Limits to production potential in Malawian fisheries are suggested by production figures over the last decade (Table 3.4.1). The mean volume of output over the three years 1979-81 is actually 26 per cent down on that for 1971-73 at the beginning of the decade. Whilst this reflects in part the dislocation caused in the last years by rising lake levels and loss of boats, the figures for the previous three-year period, 1976-78, are also 7 per cent down, indicating, if not a downward trend, the absence of any upward one. Production of fish had previously expanded quite rapidly from a low base of 5.8 thousand m.t. in 1960 to the peak of 84.1 in 1972. The fall in supply is even greater when put against the rising numbers of population.

3.4.9 The Government of Malawi has sensibly eschewed the possibility of strongly promoting commercial fisheries in established artisanal areas where this would be likely to lead to undesirable substitution and loss of employment, and looked to commercial fishing as a means rather of tapping additional potential, hopefully in the future more in the northern lake where artisanal fishing is difficult or hazardous. The commercial catch (Table 3.4.2) has not expanded over time and indeed has declined since 1975. MALDECO, a subsidiary of the MDC, accounts for a significant portion of commercial output (over 60 per cent in 1978). However substantial expansion of production through commercial fishing as a basis for expansion of a fish processing industry is probably not to be expected. The privately owned Salima fish cannery has recently been licensed to operate two trawlers of its own, but this may help to secure viability rather than expansion of this canning enterprise, and entails a degree of risk, as well as a possibility of substitution for artisanal supplies. Experience with this enterprise may serve as a useful indicator of practical possibilities for fishing in the more northerly sections of the lake.

3.4.10 Despite falling output, there is an urgent need, for the reasons already outlined, to offer maximum assistance to artisanal fishing. This would not take the form of major increases in extension effort, as local fishermen already have considerable skills and accumulated knowledge of the fishery. Large numbers of fishermen fish without boats, particularly among part-time fishermen, and demand exists also among those employed as assistants. Credit is needed to facilitate the acquisition of boats, engines and nets as well as direct promotion of the boat-building industry, including

identification of suitable wood supplies. At present only some 5 per cent of boats are equipped with engines.

3.4.11 In providing assistance in boat-building consideration might be given to giving priority in the allocation of scarce Mulanje cedar to the boat-building industry: while no other use of timber specifically requires this cedar, satisfaction of the entire needs of this industry would absorb only a minute percentage of the existing stock of such timber, and could thus represent the most sensible use of the limited yield available. This is important in view of the growing scarcity of large trees suited to the production of dug-out canoes. An experimental project by the Department to produce fishing craft of ferrous cement rather than wood may have potential, but still needs to be proven in terms of cost and effectiveness. At present planked boats comprise only just over 10 per cent of the total.

3.4.12 At present processing is carried out in the case of the artisanal industry not by the fishermen, for the most part, but by a separate category of full or part-time beach processors. The latter may dry or smoke the fish and either transport or retail the fish themselves to one or two customary markets which they have, or sell to visiting traders. Present processing facilities are inadequate and unhygienic, and could be substantially improved: spoilage is estimated at 30 per cent. The condition of the fish is thought to be inhibiting exports of dried fish, despite the significant quantities which do reach export markets, particularly in Zambia. It is possible that effective fish supply might be achieved even better by reduction in fish losses and improved quality by improvements in fish handling, processing, transportation and marketing than by increases in gross catch.

3.4.13 The development of fresh fish marketing through the provision of ice and the improvement of facilities for drying are direct substitutes, and can therefore both be considered as forms of processing, with the object of preservation. The CSC, MALDECO and Fisheries Department all manufacture and sell ice to traders who travel long distances to procure it, indicating that this constitutes a critical element in fish marketing. Investment in additional ice availability points could therefore have high returns.

3.4.14 Most important is to improve knowledge of techniques of and facilities for drying and preservation among traditional processors. Research focussing on a combination of simple drying and smoking methods has demonstrated the possibility of reducing spoilage by over two-thirds, equivalent to a fifth of the total catch, at particular times of the year.

3.4.15 Efforts need to be made, thirdly, to develop fish landing and processing areas in the northern part of the lake.

3.4.16 Three possible arguments may be made for a relatively greater emphasis on production of fish through fish ponds: (a) the need to achieve wider availability of fish, particularly in areas away from the lake, as a key protein source for low-income farm households; (b) diminishing output and availability of lake fish, particularly in relation to increasing demand, and (c) the possibility, to be ascertained, of producing fish in this way with reduced effort and at lower cost.

3.4.17 In relation to (a), it has been estimated that per capita fish consumption in the Central and Northern Regions is no more than 3-4½ kg. per annum,[1/] implying a particular need to emphasise fish ponds in these regions. Suitable land and water is apparently available in most districts. An FAO project proposal has been prepared. Fish farming in either south or central Malawi may also prove to be of particular value in providing more regular supplies for processing, including canning for export or for the domestic market. Yields of 2 tons/ha. have been obtained from non-agricultural land under research conditions, and of 5 tons/ha. in a small commercial unit of 12 ha. at Sucoma.

1/ IBRD, 1979.

3.5 Forest resources

3.5.1 Malawi's forest resources constitute something of a paradox. About 40 per cent of the land surface of Malawi is under forest (20 per cent as natural woodland on customary land, 11 per cent in National Parks and Game Reserves, and 9 per cent under Forest Reserves and Protected Hill Slopes),[1/] yet a serious, indeed critical problem of wood availability, particularly fuelwood availability to Malawian rural households, has emerged. A very high proportion of the population of Malawi is dependent on wood fuel for cooking and heating, while poles are a crucial element in rural housing construction. Even in urban centres wood is still the most commonly used form of domestic fuel. If it is the case that 99 per cent of all wood consumed in Malawi comprises fuelwood and poles,[2/] this paradox is the single most striking feature of the forest sector. Fuelwood and pole production/consumption is estimated at 10.6 million m^3 per annum compared to an annual production of industrial roundwood for other purposes of just 84,500 m^3.

3.5.2 Recent information issued by the Ministry of Natural Resources (Table 3.5.1) puts the total area of man-made forests in Malawi, including unreserved woodland, at about 3,950,000 ha. of which 3,100,000 ha is unreserved woodland and 763,000 ha. is legally constituted forest on reserved land. Most of the remaining 90,000 ha. are made up of central government plantations (75,000 ha.). Local authority forests are of minor importance, and there are just 2,000 ha. of officially established rural woodlots. There are some 12,000 ha. of private forests established by the various tobacco and tea estates. The largest portion of the central government plantations comprises the Viphya Pulpwood Project, accounting for 53,100 ha. or 71 per cent of the total.

3.5.3 The main divisions are thus between (a) the Viphya plantation; (b) the government plantations in the southern part of the

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1/ Many of the forest reserves have primarily a protective function in areas of steep topography, and National Parks also, are not available as sources of fuelwood. However this still leaves a very large forest area.

2/ Ministry of Natural Resources, Forestry Division, Background to Forestry in Malawi, 1980, p. 3.

country, developed to yield sawn timber and transmission poles; and (c) fuel plantations developed partly (i) by agricultural estates for drying tobacco or tea and partly (ii) for domestic supplies of fuelwood, these located particularly near urban centres. Mention may be made also of the Fort Lister plantation on Mulanje Mountain, developed to provide splints for the Blantyre match factory.

3.5.4 The bulk of the forest plantations in Malawi, 88-92 per cent according to different estimates (Table 3.5.2), is made up of conifers, 67-73 per cent of this being designated as pulpwood and the rest as saw timber. Only 5-10 per cent are hardwood plantations of direct potential use as fuelwood and poles. A key question is whether this will prove to have been the best form of investment, given the developing critical shortage of other types of wood suitable as fuel, particularly, and the non-feasibility of the original objective for the pinewood, the production of pulp for export.

3.5.5 Until 1964 the history of forestry in Malawi was 'associated primarily with the creation of reserves for protection purposes' and 'the establishment of quite modest areas of softwood plantations for sawn timber production'.[1/] The bulk of investment in softwood afforestation thus appears to have occurred after Independence in 1964, when the Viphya Project was established in the northern part of the country, with assistance from the U.K. The area under this project now amounts to over 52,000 ha. Current plans, including those for sawn timber production, are for an area of 78,000 hectares of plantations by the year 2011.

3.5.6 The project as originally envisaged was for a pulp mill of planned annual capacity of 180,000 tons of bleached kraft pulp, to be established at a total cost of some K320 million. The entire output was to be for export. About 94 per cent of the Viphya Plantation is pine (Table 3.5.3). As observed in a recent ODA Viphya Utilization Study, the pulpmill has been unattractive to investors because of high constructional, infrastructural and transport development costs. Apart from this there would be high transport costs for the exported pulp

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1/ Background to Forestry in Malawi, loc. cit., p. 1.

itself, while in any case other neighbouring countries are developing their own reserves.[1/] This will affect wood based industries generally. The ODA study notes that "Studies in other countries in the region, the Republic of South Africa, Mozambique, Zambia and Zimbabwe, indicate that all these have adequate forest resources and are either developing timber and wood-based industries or plan to develop such industries. It is therefore improbable that Malawi will be able to develop a sizeable sustained export trade in timber or wood-based products with other countries in the region".[2/]

3.5.7 The scope for utilization of the Viphya forest as a source of sawn timber is limited by the cost of transport of such timber to the main populated centres of demand in Central and South Malawi, and by the greater proximity of other, existing supplies in those regions. Plantations in the south will generally satisfy the internal demand for timber and wood based products (except the major requirements of the traditional sector and for fuelwood) until the end of the century and beyond, on a sustainable yield basis.[3/] Hence only a small proportion of the Viphya resources will be needed for sawn timber.

3.5.8 Given the scale of this forest resource, minds are being exercised to devise the best use to which it could be put. Some of the possible industrial uses are reviewed in a later section. Even if the original purpose underlying the investment does not materialise, the existence of a resource on this scale could provide a major opportunity in a new direction sometime in the future. There is some danger, however, that its existence diverts government attention, personnel and finance from the much clearer demands for wood supplies suitable for fuelwood and traditional construction where a huge deficit is apparent and where the 'basic needs' of a substantial part

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1/ Recent studies, however, have been of a wood-based complex at Chinteche involving a pulp, paper, sawnwood and panel mill, the mill consisting of a reconditioned groundwood unit of 12,000 tons capacity eschewing any chemical process and catering only for the domestic market and indeed only part of that.

2/ ODA Viphya Utilization Study, 1980, p. iii.

3/ ODA Study.

of the population are in jeopardy, not to mention the substantial requirements of the tobacco export industry. Thus a government statement of 1980, referring to the 48,846 ha. already established, still talks of the 64,700 ha. needed to sustain the proposed pulp mill.[1/]

3.5.9 While the traditional sector or sectors in Malawi make huge demands on the supply of fuelwood, timber is required for a wide range of purposes. The majority of houses are still of mud and wattle, and require building poles: accounting in fact for an estimated 13 per cent of the combined demand for fuelwood and poles in 1980, over 1½ million m^3 per annum.[2/] The longer exotic poles grown on plantations have great potential value here, if they can be made available at a low cost. This housing still requires sawn timber for doors and window frames. The smaller quantity of brick housing would preferably require sawnwood roof timbers, but necessity has often entailed the use of roundwood even here. In addition indigenous wood supplies are used for constructing maize stores, tobacco barns, and for cattle kraals and fencing. Indigenous fuelwood is used in the small-scale brickmaking industry, for burning lime, and for smoking fish. Wood is used in boatmaking, for handicrafts, and especially in small-scale furniture-making in rural and urban areas. It is therefore not just a consumption item as fuel, but an input into a wide range of economic activities within the local economy.

3.5.10 Even where sawn wood is employed, this is often handsawn. An important point for consideration, therefore, as natural supplies are augmented by government action, is how intervention can be achieved while maintaining the low cost at which wood is made available to traditional and small-scale users.

3.5.11 Already there is estimated to be an apparent general deficit in the supply of fuelwood and poles amounting to 2.2 million m^3 in 1980, on the basis of sustainable supplies.[3/] Deficits existed in 1980 in 15 out of the 24 Districts of Malawi, including all Districts in the Southern Region except Mwanza, and all Districts of the Central Region except Salima, Ntcheu and Nkhotakota. In twenty years all but three would be in deficit.[4/] The estimated potential supply of 8.8

1/ Background to Forestry in Malawi, p. 4.

2/ Wood Fuel in Malawi, loc. cit., p. 6.

3/ Background to Forestry in Malawi, p. 7.

4/ Wood Fuel in Malawi, p. 7.

million m^3 in 1977 was only 80 per cent of the estimated annual consumption of 11 million, implying consumption well in excess of the sustainable level of supplies and thus at the expense of forest destruction and future availability. The imbalance is most acute in particular districts, with demand in Lilongwe District, for instance, estimated at six times as great as potential supply.

3.5.12 A factor affecting future supplies is the rate of agricultural expansion into previously uncultivated Customary Land, largely wooded, at an estimated 3.5 per cent of such land per annum.[1/] This rate would account for one-fifth of the total area in six years. Already in some of the densely populated areas such as the Lilongwe Plain, little natural woody vegetation is left.

3.5.13 Projections made by the Department of Forestry show fuelwood demand to expand by 77 per cent from 10.3 million m^3 in 1980 to 18.2 million in the year 2010 (Table 3.5.4), with household demand increasing by nearly 90 per cent. Demand for poles is only 14.4 per cent of the combined volume of wood in 1980, but is projected to increase by a 100 per cent by the year 2010 (Table 3.5.5). The figures projected for fuelwood appear to be substantial underestimates of real wood requirements since they are based on an assumed drop in domestic wood use per head from 0.85 m^3 in 1980 to 0.65 m^3 in 2010, partly as a result of increasing scarcity of firewood (which is supply, not demand) and partly because of the 'expected use of wood-saving stoves', the impact of which should be considered uncertain at the moment.

3.5.14 Quite apart from the effects of wood shortages on the basic needs of households, and on the tobacco and other industries, these imbalances carry dangers of overcutting in forest reserves, constituting a serious threat to the stability of agriculture and the rural environment.

3.5.15 Another effect on agriculture arises out of labour time spent in collecting fuelwood. Over 90 per cent of rural households collect all their firewood, and about 20 per cent currently walk a round trip of four miles or more for this purpose, going up to more

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1/ Wood Fuel in Malawi, p. 3.

than 40 per cent in a few districts in the south.[1] These percentages and the distances walked are likely to increase rapidly. This labour time needs to be added to that spent in fetching water.

3.5.16 Coal is not a serious alternative for rural use, because of the prohibitive cost of delivery to widely scattered communities, especially, while the rising price of imported kerosene, the most direct substitute at present, has been producing substitution towards, not away from wood. The difficulty of converting traditional burners in tobacco-curing also means that in general wood scarcity means loss of production or consumption rather than substitution of alternative forms of energy.

3.5.17 Charcoal is a more obvious possibility. It is not a traditional fuel of any importance in Malawi, partly due to the comparative accessibility of fuelwood until recent years, although it is sold in urban areas. The 1981 Rural Energy Survey showed negligible use of charcoal in any of the major household or farm tasks, apart from a 5 per cent usage in smoking fish or meat. The possibilities for developing charcoal production or a charcoal industry are considered in Chapter IV.

3.5.18 The two policy conclusions which arise out of the foregoing are, first, that Departmental efforts should be directed emphatically towards solution or alleviation of this problem above others, and secondly, that the potential conflicts between the demands of competing users need to be seriously considered and acted upon.

3.5.19 A number of initiatives have already been taken in the first direction. A Wood Energy Unit has been established in the Ministry of Agriculture. A Rural Fuelwood and Poles Project, financed mainly by the ODA was started in 1976, and had established some 700 ha. of eucalyptus plantation by the end of 1980. The original integrated rural development projects in Malawi have had forestry components, as have the eight smaller rural development project areas operating from 1976. Since a National Tree Planting Day was inaugurated in the same year as much as 2,000 ha. of woodlots may have been established through schools and colleges. There is (since 1978) a Rural Fuelwood Research Project, funded by CIDA.

1/ Malawi Rural Energy Survey, Wood Energy Unit, Ministry of Agriculture, December, 1981.

Since 1972 over 5,000 ha. of eucalyptus plantations have been established by the Kasungu Flue-Cured Tobacco Authority (KFCTA). The Wood Energy Project which came out of the 1978 study of fuelwood and pole supply and demand, and is funded for 1980-85, has a fairly ambitious programme involving the establishment of 88 nurseries (each to produce 100,000 plants per annum from 1980-81), some 12,900 ha. of fuelwood and pole plantations over four years from 1981-2, including 9,000 ha. within forest reserves in Blantyre, Zomba and Lilongwe Districts, and charcoal production trials.

3.5.20 Nevertheless the present extent of fuelwood plantations is quite small, particularly if those under the control of the tobacco and tea estates is excluded, so that the bulk of demand is satisfied from the slow-growing indigenous forests on the Customary Land and Forest Reserves. No more than 2,000 hectares of plantations exist devoted specifically to fuelwood and pole production, the majority of these recently planted.[1/] This compares with the 45,000 hectare investment in pines in the Viphya Plateau. Out of 15,200 ha. of plantations established by 1980 by the Central Government, District Councils and private agencies primarily or partly for fuelwood and poles production (Table 3.5.6) only a small proportion will be directed to general consumption. Even the new plantations established under the Wood Energy Project will only deliver at maximum productivity in 1990 half a million m^3, amounting to no more than 3½ per cent of total projected demand in that year, or less than 20 per cent of the 1980 net supply deficit for Malawi.[2/] The 15,200 ha. referred to above will eventually supply no more than 230,000 m^3 annually, another 1.56 per cent of demand in 1990.

3.5.21 An obvious means of tackling the problem, given also the scarcity of land in populated agricultural areas for the establishment of new forest reserves, is agro-forestry carried out by smallholders themselves, and this is being given urgent attention. Research into appropriate species is being carried out through the CIDA project. An earlier woodlot campaign carried out at the time when the Forestry Extension Service existed apparently did have some impact. However using a current average annual consumption of 0.85 m^3 per head, it is

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1/ ODA Viphya Utilization Study.

2/ Wood Fuel in Malawi, p. 14.

estimated that for a rural family of five as much as 0.4 hectares of family woodlot would be required.[1] It seems quite unrealistic to expect such an area to be planted or looked after to maturity by a large number of households.

3.5.22 For a number of reasons any effort on the farmer's part is likely to require supplementation. Farmers at low levels of income and exposed to risk are likely to discount the future, especially that of the next generation. For the same reason they are likely to make a sub-optimal choice as between putting land under crops and under trees, or applying labour to each. Thirdly, where the household responsible for planting and maintenance is not assured of keeping the eventual product for itself, there will be a divergence between private and social benefit in planting decisions. Consequently more direct intervention in planting by the Forestry Department, perhaps through village woodlots or woodlots serving several villages, may need to be considered, to make use of whatever land is suitable.

3.5.23 A further problem is created for rural households by the demands of contractors who transport wood to the urban centres for resale to private consumers or industrial users, and of the estates, in particular the small and medium scale estates which make less of their own provision for fuelwood supplies. The amount of fuel used in tobacco processing is very large, as shown by the following estimates of fuelwood consumption in 1980.[2]

Consumption for:	(m^3)	(%)
Domestic purposes	4,939,380	49
Institutions (schools, etc.)	31,850	0.3
Tobacco processing	4,667,100	47
(flue curing)	(2,945,100)	(29)
(fire curing)	(1,722,000)	(17)
Other industries (brick-making, tea drying, etc.)	385,180	4
TOTAL	10,023,510	100

1/ IBRD, Malawi Phase II of the National Rural Development Program (Wood Energy Project) Staff Appraisal Report, IBRD Report 2625 - MAI, Washington, February 8, 1980.

2/ Wood Fuel in Malawi. Data are projections from information gathered in 1977.

The 4,667,100 m^3 used in tobacco processing, a substantial part by estates, represents 47 per cent of the total, compared to 49 per cent for domestic purposes. These two uses are thus in direct conflict with each other. To safeguard the interests of rural households and to stimulate estates to make provision for themselves, consideration might be given to raising fees for cutting wood and tightening controls on access by large users.

3.5.24 To deal with the impending fuelwood crisis, therefore, it is likely that no single approach will be sufficient, but rather a combination of approaches covering household woodlots, village woodlots, additional fuelwood plantations within reach of rural consuming populations and new measures relating to access by large users.

3.6 Energy resources

3.6.1 Malawi imports all her liquid fuel, and relies mainly on two domestic energy sources: fuelwood, and hydro-electric power. In terms of energy value, measured in megajoules, fuelwood accounts for an overwhelming 94 per cent of energy consumed (1979, Table 3.6.1), compared with less than one per cent for hydro-power. This serves to underline the importance of the impending fuelwood crisis already discussed.

3.6.2 The possibilities for coal and for charcoal production have already been reviewed in Sections 3.1 and 3.5.

3.6.3 Although the critical position in respect of fuelwood will increasingly affect rural households, the tobacco processing industry, and dispersed rural industries such as brickmakers, bakeries and sawmills, this supply is not directly substitutable by hydro-power. Consequently increased shortages imply the importation of fossil fuels, kerosene and diesel, at great expense. The lack of substitutability stems from the fact that rural electrification would require major investments in transmission systems, so that only very limited lines, and these uneconomic, can be expected, while on the other side fuelwood is simply not available for large scale and urban industrial consumption. Thus hydro-power and fuelwood are complementary sources of energy, supplying different segments of the market. Hydro-electric power constitutes the main energy source in the formal sector, however, for medium and large-scale industry.

3.6.4 Malawi, fortunately, is rich in water resources. Lake Malawi has been described as a gigantic reservoir, which discharges at its southern end into Malawi's main river, the Shire. This river falls 1,260 feet over a fifty mile stretch between Kholonbidzo Falls and Kapachira Falls. The total power potential over this stretch has been estimated at 415 MW, with overall Malawian hydro-power potential at some 600 MW, compared to the present established capacity of just 104 MW.

3.6.5 The bulk of electricity generation capacity is operated by the parastatal Electricity Supply Company of Malawi (ESCOM) (Table 3.6.2), although there were 75 private licences for electricity generation extant in February, 1982, including a large number possessed by tea estates. Of these 59 were for diesel (amounting to 6.237 MW), 9 for thermal (0.951 MW) and 7 for hydro-electricity (1.162 MW), totalling

14.35 MW. A gas turbine has operated in the Blantyre area since 1975.

3.6.6 ESCOM capacity is concentrated in the Southern Region, on the Shire. The first hydro-plant was built there at Nkulla Falls I in 1966, comprising 24 MW. This was followed in 1970 by 16 MW at Tedzani Falls I and 24 MW at Tedzani Falls II in 1973. A further 40 MW at Nkulla Falls II brought the total to 104 MW in 1980. Scope exists for adding another 100 MW here in stages during the 1980's as warranted by demand.

3.6.7 In the Central and Northern regions several of the rivers connected to Lake Malawi are known to possess valuable hydro-power potential, not yet fully investigated. The most significant site is on the South Rukuru at Mfufu Falls which, with upstream reservoirs, might be capable of providing as much as 180 MW,[1/] but there are a number of other, smaller sites with smaller potential.

3.6.8 A UNTCD team[2/] investigated a number of small hydropower sites in 1981, concentrating on Karonga and Chitipa Districts out of reach of the national grid. Two viable projects were identified, the Karonga project on the North Rukuru river and the Chilumba Project at the confluence of the Manchele and Kazichi rivers. The first of these could supply some 500 kw of power to Karonga and the adjoining localities up to a radius of 25 miles. The second, with 200 kw of power, could supply consumers in the remote and isolated communities of Livingstone, Chitumba, Khwawa and Chilumba. Investment costs for the two projects are estimated at US $1.5 and 0.4 million respectively. Costs of production at Karonga plant of at most US 6.27 ¢ at 45 per cent load factor compares favourably with the 21 ¢ for diesel generation, with similar figures for Chilumba. Hydro-power involves much higher unit capital costs than diesel, but huge transport costs are involved in bringing fuel 1,500 km. from the Indian Ocean, as well as uncertainty and irregularity of supply. This is partly due to the state of the roads in the wet season which has sometimes necessitated

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1/ R.S. Drayton, A Preliminary Survey of the Water Resources of Malawi, Dept. of Lands, Valuation and Water, OTC, MRB-No. TN 11, Lilongwe, August, 1980.

2/ UNTCD, Evaluation of Small Hydro-power Sites in Malawi, Report of mission to Malawi, 11 May - 2 June, 1981, TCD/TM - 20 - 240/, New York, 1981.

fuel being flown in. Diesel also suffers from reduced efficiency at high altitudes. Whether the investments are absolutely economic as measured by the economic rate of return is not calculated, but there is clearly value in the support given to much needed growth points in the north.

3.6.9 In 1980 ESCOM supplied altogether some 390 million units of electricity, 98.6 per cent of this from hydro-power, and most of the small remainder from diesel (in the north). The development of the interconnected system upwards through Central Malawi has brought more and more centres into the main grid and thus meant the progressive substitution of a local resource, hydro-electricity (though HEP has a significant import content in the form of capital equipment for construction, generation and transmission) for imported diesel fuel. Lilongwe, Salima, Kasungu and in 1982 Mzuzu (where the diesel plant now operates as standby) have each in turn been incorporated, with a further extension to Rumphi planned by January, 1983. By then most of the important load centres in the South, Central and some of the Northern regions will be connected to the main grid. The main omissions will be Karonga and Chitipa Districts which are not likely to be connected for many years to come, but which could be supplied by smaller schemes as just discussed. This means that Malawi is very well placed indeed as far as power supplies to serve possible small or large industries distributed along this long north-south line of the country, though other infrastructural constraints are operative in the centre/north. The growth of the interconnected system has been impressive, starting with 36.22 million units sold to 4,379 consumers in 1964, at Independence, to 114.73 million to 8,090 consumers in 1970, and to 350.15 million to 21,835 consumers in 1980. Of course, given the limited urban development in Malawi, this still represents only the merest fraction of the total population.

3.6.10 <u>Planning of electricity supply capacity by ESCOM is severely affected by major indivisibilities on the demand side</u>, apart from the normal supply indivisibilities. Two-thirds of current demand comes from four institutions or companies, partly the Blantyre Water Board and the Sucoma Sugar Estate, for pumping water in both cases, and David Whitehead's, the textile manufacturers. The same 'lumpiness' affects projected demand. Thus total sales from the interconnected system are planned to increase from 338.5 GWH in 1981 to 468.0 in 1984 and then 1,129.2 in 1986 (Table 3.6.3). Of the increase 1984-86

of 661.2 units, 409 is accounted by the anticipated fertilizer plant, or 62 per cent, 170 by the Viphya woodpulp project (26 per cent) and 35 by the Viphya sawmill (5 per cent). Most of this demand is unlikely to materialise, though still included in ESCOM projections. The fertilizer plant which would itself have absorbed 70 MW, is still under discussion by a Canadian company, as mentioned already, but the World Bank appraisal was pessimistic. The pulp project is equally uncertain. The proposal is to produce pulp by grinding, a process which is energy intensive and could absorb 30 MW. Another project eyed by ESCOM, for an additional cement plant, is in suspense. The ethanol project would require less than one MW. Moreover this represents the bulk of the project increase to 1991 where the expectation is of a 1,291.5 total, of which the three projects above would account for 47.5 per cent. Clearly the future must be regarded as highly uncertain, with demand the constraint rather than supply.

3.6.11 Funds amounting to 7 or 8 million kwacha have been made available to ESCOM as a soft loan by the African Development Bank to support a rural electrification programme. This is likely to be extremely expensive per unit supplied, due to the investment required in source development and overall electrical distribution systems. This cost would be out of reach of the average Malawian without heavy subsidisation, and the demand from the relatively small number of rural artisans will be minimal. Even in the main industrial centres the bulk of demand is accounted for by a few large-scale users, including non-industrial users. Most of the present demand from the domestic sector comes from low-density residential consumers (for air conditioning, not lighting) and this is not an expanding market. The priority would be for high density urban consumers. What rural electricity supplies are provided should be concentrated along the main north-south link (and existing branches), which already provides a sufficient number of 'growth points' right through the country if separate provision is made in the north.

3.6.12 A significant contribution towards economising expensive imports of petrol is the ethanol plant already discussed in section 3.2, based on molasses. This could save as much as 20 per cent of Malawi's petrol import bill.

3.6.13 Other energy sources which are in the development phase are solar energy, biogas, and wind power. Of these solar energy appears the most relevant, and the most advanced as a practical possibility. Considerable progress has been made in neighbouring Zimbabwe in developing low-cost water heaters for low-income housing. Extensive trials have been carried out by Gweru City Council and look very promising, with possibilities for schools and similar institutions. The system is simple enough to be used by army and road gangs for field showers. The most important immediate application would be with solar barns for crop drying, for grain and especially tobacco. In the Zimbabwean experiments a barn roof is painted and the accumulating warm air trapped between roof and ceiling to be blown by electric fans through the tobacco or grain. Given the disproportionate demands of tobacco drying on fuelwood supplies, some 47 per cent (paragraph 3.5.23), this could be very important. Curing a hectare of tobacco requires an equivalent hectare of forest. Moreover Malawi does not have an alternative in the form of conveniently located coal as in Zimbabwe's case.

3.6.14 Research and development towards economic production of biogas has been promising, and this will clearly need to be followed closely by Malawi.

3.6.15 In conclusion, the main problems confronted by Malawi are the rising costs of imported fossil fuels and the increasing scarcity of domestic fuelwood, leading to over-utilization of forests at the expense of future forest yield. The important policy measures are to continue to develop hydro-electric power for the urban/industrial centres in line with demand (demand being the constraint); to expand and safeguard future supplies of fuelwood by the means described in Section 3.4, through planting in appropriate areas, controls and pricing, and improved management of wood resources; and to improve efficiency in fuelwood use through encouragement of charcoal production and the development of energy-efficient equipment for tobacco curing. The possibilities of drying tobacco with solar energy should be especially closely monitored.

CHAPTER IV

PROSPECTS FOR SPECIFIC RESOURCE-BASED INDUSTRIES

4.1 Mineral-based industries

4.1.1 The potential for mineral-based industries in Malawi is obviously quite narrowly circumscribed in the absence of any major natural deposit. The most obvious disadvantage to a resource-based industrial development strategy is the absence of linkages into other industries stemming from a mineral base such as coal, iron or petroleum. This requires Malawi to depend correspondingly more heavily on its agricultural base, however composed, or on labour-based, i.e. labour-intensive activities to secure comparative advantage.

4.1.2 The largest mining and mineral processing enterprise in Malawi at present, as already stated, is the Portland Cement Company's operation at Changalume. A second cement factory at Mayeka, north-east of Kasungu in the north, awaits an investment decision. A feasibility study carried out by Cementia Ltd. showed a 12 per cent rate of return, but a Spanish company is more optimistic. The investment required has been estimated at some K46-60 million at 1981 prices, but it may be that a smaller capital investment would suffice. Reserves, made up of low magnesia marble bodies, amount to about 10.8 MT. It is questionable whether this is an immediate prospect, since the present cement factory is able to satisfy current needs, and the depressed state of the economy has produced a lack of buoyancy in the construction sector, but negotiations are continuing. Demand for Kasungu cement will depend on a resurgence of the Malawian economy, and especially on economic development in the north.

4.1.3 One of a number of valuable small-scale industrial activities in Malawi is traditional lime-burning. The existence of suitable marble deposits was discussed earlier. One small company and half-a-dozen cooperative or village groups are involved in the industry. These operate in a labour-intensive way with simple kilns, and reduce costs further by operating on a seasonal basis. They are thus able to supply lime from dispersed sites at very competitive prices. Together

they are thought to produce over 10,000 tons per annum. Assistance is required, however, in extension and training, and perhaps in the form of credit to expand the number of enterprises. The kilns in use are not very efficient, and need improvement, while many of the artisans are in the older age-groups, suggesting the need to train assistants who will be in a position to carry on the industry. This extension service would be combined with that to small-scale brickmaking, as described presently.

4.1.4 The existence of kaolinite and kaolinitic clays which might form the basis of a small ceramic industry has been mentioned. The focus would necessarily be on the domestic market and it would be necessary to investigate just how much scope this will offer. Artistic pottery might attract tourist sales.

4.1.5 One promising industrial possibility which is being actively pursued is the production of glass, based on the extensive glass sand deposits which have been identified in Malawi. The proposal is to produce ordinary flint glass, but not sheet and plate glass, for which the minimum viable-sized plant is many times greater than total Malawian demand. Since sheet and plate constitute no more than 10 per cent of glass imports, it is thought possible to import-substitute for about 85 per cent of all imports, for which the most important supplier is the Republic of South Africa. The plant would concentrate, sensibly, on producing containers, i.e. bottles and jars, including those for beer and soft drinks, for which there is a basic demand within Malawi, but non-crystal glassware would also be produced. It may also be possible to press a one-size window panel for low-cost housing. A workforce of one hundred workers is anticipated. Indebank have already made the decision to invest.

4.1.6 The glass would be melted hydroelectrically, avoiding the use of imported oil, which is commonly used. Demand for HEP may be up to one MW. Synthesised soda ash may be imported for use as flux, but it should be possible to effect savings using nepheline syenite, which is in plentiful supply in Malawi.

4.1.7 The clay content of the sands, which needs to be separated out, offers some potential for industrial pottery (wash basins and similar products), which is being evaluated.

4.1.8 A major industry in Malawi, though this is not always realised, and one which is based on local mineral resources, is the traditional brickmaking industry. A recent survey suggested that about 400 small brickmaking enterprises employed over 15,000 people (compared to one hundred, say, which might be employed by a large cement factory).[1/] Output from these enterprises was estimated to be some 54 million bricks a year. A more recent assessment put output of hand-made bricks at 70 million, compared to only one million of machine-made bricks in 1981: implying that the machine-based industry produces less than 1½ per cent of bricks used in Malawi.[2/] This itself suggests that, even if a project is successfully (re-) established for the supply of superior machine-made bricks to the Blantyre market, the main focus of interest should be the traditional industry.

4.1.9 The technology employed is simple in the extreme. A portable wooden mould is used for shaping the bricks and, for firing, wood-fueled 'clamps' or field kilns, simply stacks of bricks with open channels running through at ground level to accommodate fuel. The bricks are often underfired and lack the life of the machine-made bricks.

4.1.10 They have a major cost advantage, however, selling prices being in the range of K10-25 per thousand compared to K50-250 for the machine-made. They are thus turned out for no more than 10-20 per cent of the cost of the latter.

4.1.11 The low costs of production achieved are accompanied by a number of advantages associated with small-scale, informal sector operations. The industry operates seasonally, with a season of 4.36 months' average duration,[3/] thus making use of seasonally surplus labour. Associated with this, out of 15,240 employees in 400 brickmaking enterprises covered in the same survey 9,400 (62 per cent) were women and young people (including 4,000 women) and just 38 per cent

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1/ Carried out as part of UNIDO 515 Project MLW/77/802 and summarised in W. Buchanan, Development of Brickmaking Industry and Inventory of Industrial Ceramic Raw Materials, Draft Terminal Report, DP/MLW/78/003, Lilongwe, 1982, Appendix I.

2/ Ibid., Appendix I.

3/ Buchanan, loc. cit.

were men. The enterprises have a useful transport advantage in supplying rural centres, since transport of the raw material over long distances is generally uneconomic, favouring a dispersed small-scale industry if suitable raw materials can be identified. A final advantage of dispersal within the rural areas is easier access to cheap woodfuel supplies, fuel representing a major input.

4.1.12 Two supposed drawbacks have been ascribed to the traditional industry and mode of production. The first relates to quality, where traditional bricks are certainly not as good or as long-lasting. This disadvantage has to be weighed against a cost of no more than one-fifth to one-tenth of machine-made bricks. For simple rural housing at least, where bricks make up a significant part of total construction cost, this would permit even significantly shorter-lived constructions to be economic. For low-income purchasers of rural housing, if not housing generally, a high rate of discount of the future is applicable, putting the emphasis on low costs now. The low cost of bricks is in fact the only way in which these would be much used in the rural areas, despite the low level of purchasing power, given competition from more traditional materials made in a similar way: to a large extent, therefore, it is a matter of this method of production or nothing, as far as rural demand is concerned. The less certain question is which is the appropriate mode of production for the urban and low cost housing market, given that some 15 to 20 per cent of higher quality bricks for this market are already produced in the informal sector. One attempt to establish a machine-based enterprise was not successful. If, on the other hand, cheap bricks are to be employed in low cost housing, this may require some re-thinking of approach.

4.1.13 The other question is whether, in relation to rural housing, the use of bricks is likely to be restricted to a limited number of specific buildings such as administrative centres, schools and clinics or whether bricks can become a major medium for rural construction. This may depend on assistance to the traditional industry to allow it to increase output and availability. However the use of bricks in Malawi does appear to be significantly more widespread than in most African countries, suggesting that the existing traditional industry may provide the necessary foundation for development on the basis of simple, low cost technology and organisation.

4.1.14 What assistance needs to be offered to the industry clearly requires consideration. Under a recent UNIDO extension project improved moulds were introduced to a limited number of brickmakers, and a simple downdraft kiln constructed. Improvement of the firing process is clearly a priority, especially if some of the advantages of the existing methods can be incorporated, the possibility of building up kilns on site, and to any appropriate size. Assurance by the Geological Survey Department in identifying suitable clay deposits could be an important factor in raising quality, if a sufficiently prompt and flexible service can be provided. Numerous ad hoc requests to the GSD for this type of h e l p , from many parts of the country, indicate its potential importance.

4.1.15 The survey referred to also inquired into the problems facing small-scale brickmakers (Table 4.1.1). Forty-three per cent of brickmakers picked out lack of operating funds as the element which would prevent their expanding production, suggesting credit might be a desirable element in any programme of encouraging the industry's expansion. Problems of wood and transport availability were other significant factors, but for the most part not absence of a market, suggesting buoyant demand for the product.

4.1.16 A UNIDO Special Industrial Services Project was established in 1978 to provide assistance: (i) in preparing an inventory of industrial ceramic raw materials, in conjunction with the GSD; (ii) in investigating deposits of ceramic raw materials as regards their potential for brickmaking, ceramic and glass industries; and (iii) in establishing an extension service based on the Ministry of Trade and Industry. The potential importance of this project should be clear from the discussion above. Unfortunately the failure to provide counterpart staff, and even to take up the funds provided for fellowship training, left the expert provided relatively impotent, and means that an opportunity was to a large extent wasted which perhaps will not be made available again.

4.1.17 It may be, also, that a more or less separate extension service for this specific purpose is not feasible but that, rather, expertise should be provided through some kind of local machinery in each area as part of local rural development efforts at the level of the ADD or through the agency of the small industry organisation, SEDOM, or of the Regional Growth Centres (RGC's), since a number of integrated

elements might be involved. For instance, land use planning may be needed to resolve potential conflict with competing uses of land, such as farming, the development of fuelwood plantations and the construction of access roads.

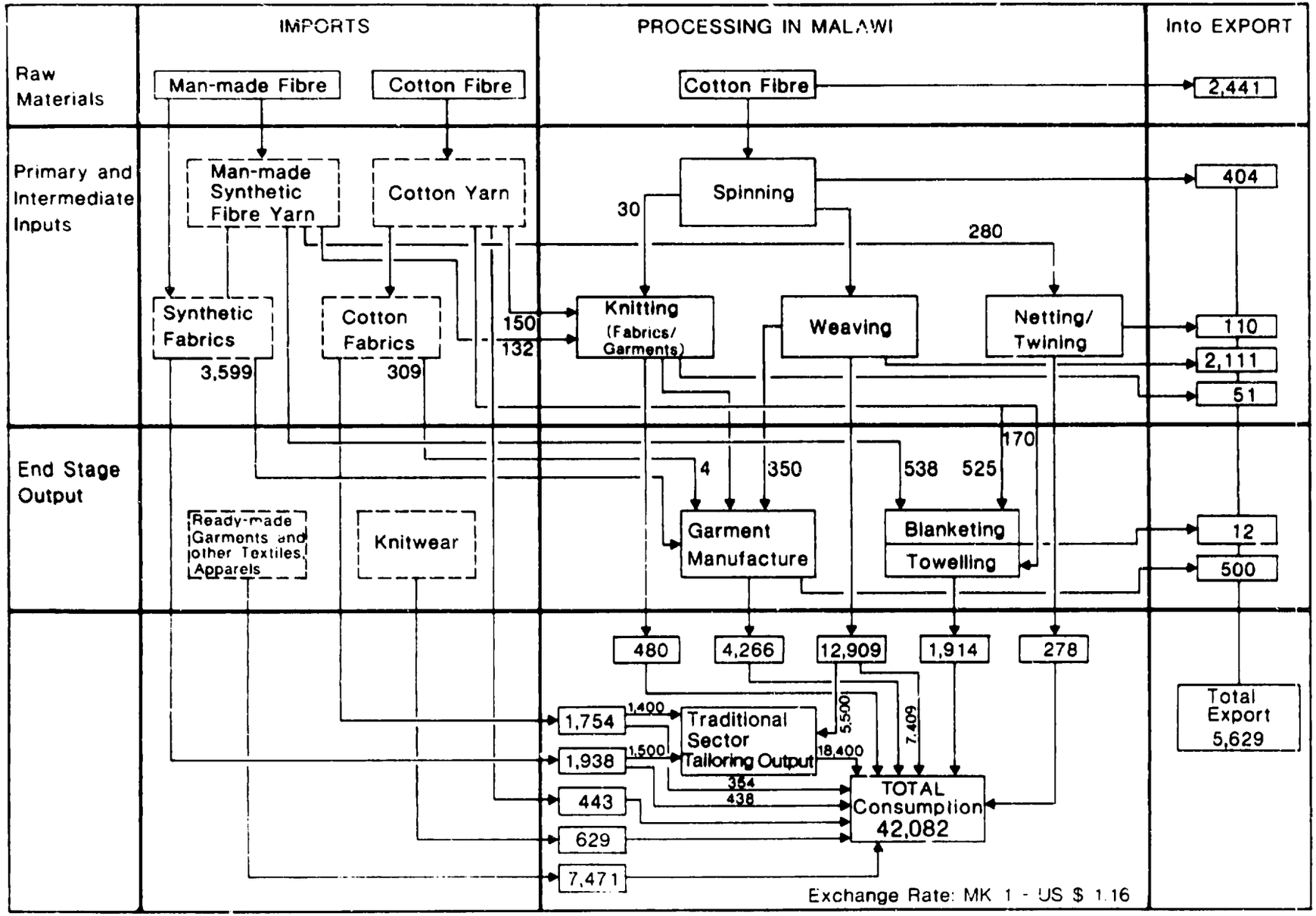
4.1.18 While this is a nationwide activity, with a substantial rural component, a major immediate consumer of bricks is Blantyre City and its environs, and economic and technical expertise needs to be devoted at once to planning the appropriate geographic and economic development of the brickmaking industry to supply the city.

4.2 Crop-based agro-processing industry

4.2.1 Tobacco is the most important cash crop in Malawi, as we have seen, and because it is a high-valued crop which needs particularly careful processing, value added in tobacco processing has made a significant contribution to manufacturing output growth. There should continue to be some expansion of output for processing but this is likely to be limited by the fuel problem and by a desire to diversify estates away from tobacco production. Not much additional processing capacity is likely to be needed, therefore, over the next decade. The main issue in processing will be how to deal with the fuelwood supply problem and how best to introduce alternative methods of processing at smallholder and estate levels.

4.2.2 As already mentioned, although cotton is by no means the most important crop in Malawi, it is one with important forward linkages, supporting first-stage agro-processing in the form of ginneries and second-stage textile and garment manufacture. About 80-90 per cent of cotton output is used for the domestic textile industry. At present Malawi has three ginneries with a combined capacity of about 32,000 tons per annum. There is scope for expansion of production, though the area suitable for expansion is circumscribed geographically. Plans exist for a new ginnery at Liwonde which would cater for raw cotton output from the central region where there has already been growth. Elsewhere existing capacity should be adequate.

4.2.3 The cotton mill operated by David Whitehead's, producing basic cotton fabrics, forms the core of the second-stage textile industry, but a significant textile sector has been established involving also knitted fabrics production, garment manufacture, towels and towelling, blankets and net making (a subsidiary of Whitehead's) (Table 4.2.1). The pattern of linkages is neatly illustrated in a flow chart prepared by GOPA (Figure 4.2.1). Over the short period 1971 to 1977, the value of industrial sector output more than tripled (Table 4.2.2). In value terms some 67 per cent of textile output in the formal sector (in 1977) was accounted for by cotton fabrics. However it can be seen that while the production of cotton fabrics is entirely based on local materials, that of garments, towelling, blankets and fishing nets has in each case a high import content, amounting to as much as three-quarters or more.



Source: GOPA-GESELLSCHAFT FUR ORGANISATION, PLANUNG UND AUSBILDUNG MBH

Figure 4.2.1 Linkages within the Malawian Textile Industry, 1977 (MK'000)

4.2.4 Informal sector tailoring is important in most African countries but perhaps exceptionally so in Malawi, though this would require statistical verification. While an estimated 5,400 persons were employed in the modern textile sector in 1977, the number in the traditional sector[1/] was between 25,000 and 30,000, about five times as many. Tailoring is thus a significant employer in Malawi. The value of output may have been around MK15 million. This thriving activity has received little or no attention from government and, while it is probably quite efficient, more information and analysis of it is required to discover what the constraints are, if any, and what assistance might be required.

4.2.5 The traditional sector uses imported materials also, but is dependent very closely on cotton fabric supplied by Whitehead's. Together the two constitute the most dynamic element in the textile sector: two-thirds of the 1971-77 increase in end-use output in the modern textile sector was of cotton fabrics. Apart from the high import content mentioned, excess capacity exists in the knitwear, blanket, towel and net-making industries. The modern garment industry has expanded fairly rapidly, although most of the fabrics are imported. This low degree of integration with David Whitehead's is made a point of criticism in the GOPA study which, however, fails to emphasise the very important forward linkage achieved by the latter with the much more important traditional tailoring industry which should be maintained and indeed developed.

4.2.6 The GOPA study identifies one tendency in Africa which will affect future prospects in the Malawian industry, and that is the trend towards falling income elasticities for cotton textiles in favour of rising elasticities of man-made fibre and blended fabrics, which have advantages in terms of working and durability. Despite the very low per capita consumption of fibre in Malawi, the proportion of man-made fibre in the total was estimated in 1977 as 15 per cent. This fact has already led Whitehead's to establish polyester production. While this development does not directly represent 'resource-based industrial development' it may permit local manufacturing industry to retain its control over the domestic textile market as it expands, absorbing whatever increased production of cotton becomes available.

1/ GOPA estimate.

4.2.7 The output of knitwear actually declined over the period 1971-77. The difficulty as seen in the GOPA study is that the industry is not supported by broad local demand but caters for the rather narrow market provided by the higher income groups. The problem would appear, however, to be one of effective demand due to lack of purchasing power, rather than need: despite seasonally low temperatures, particularly in the highlands, the total estimated per capita consumption of cotton and man-made fibres is low even for Africa at about 1.3 kg. per annum, and knitwear is scarce compared to other African countries, which have seasonal temperatures, such as Kenya.

4.2.8 The GOPA study makes some projections for the period 1977-85 (Table 4.2.3). Anticipated increases in total fibre demand are 60-80 per cent, and 50-75 per cent for home-made fabrics. That for knitwear is 39 per cent. These figures appear optimistic, involving as they do an increase in fibre consumption per caput of 30-50 per cent by weight and in per caput expenditure on clothing other than knitwear of 75-90 per cent, in value terms. This desirable progress may prove to be limited by lack of purchasing power in the rural areas. Nevertheless the prospects appear reasonably good for continued expansion in this important sector, based on the domestic market. Though there is already a certain volume of exports, prospects here are less good, with protection of the garment industry in Zambia and Zimbabwe aiming at self-sufficiency. This would certainly have been a useful industry to develop, given its labour-intensive nature and Malawi's need in the area of exports to base activities on cheap, potentially skilled labour. The disadvantages are the high import content and the transport disadvantage from which Malawi suffers, so that the GOPA team may be correct in recommending an inward-directed strategy for this sector.

4.2.9 The expansion of sugar production will carry with it a corresponding increase in sugar refining activity, though it is likely that once the target of 170,000 tons is attained this year output will have reached its zenith. A separate question is whether there will be need for a third processing plant. The prospects for this are viewed within the Ministry of Trade and Industry as less promising than originally thought.

4.2.10 One of the most interesting resource-based developments in Malawi is the plant, already on trial, to produce fuel alcohol from

molasses.[1] At present molasses is exported through Mozambique, and there could be problems of disposal of molasses if existing transportation capacity were to be needed again by Mozambique for its own shipments. Following a proposal by the IFC in 1980, the Ethanol Company Ltd. was promoted by the Oil Company of Malawi (OILCOM), Indebank, and the Dwangwa Sugar Estates (both sugar estates are managed by Lonrho). It is expected that some 20-30,000 tons of molasses will be available for processing into some 5-8 million litres of ethanol, equivalent to almost 10 per cent of current petrol consumption in Malawi. It has been established that ethanol can be blended up to 20 per cent with petrol, permitting a very significant reduction in import value. Zimbabwe already has a much bigger plant with an output of 40 million litres a year, producing 15 per cent of its fuel requirements. This is located near the Mozambique border in the east, not far from Malawi. Zimbabwe is now planning a second plant and is proposing to raise the blend to 25 per cent ethanol. This therefore looks like a sound investment. The constraint will be on the supply side, the quantity of molasses available. Blending will be at Nkhata Bay, Salima and Blantyre for the north, central and southern regions. One hundred and fifty tons of yeast for fish meal will be a by-product.

4.2.11 There may be some scope for the production of syrups and of glucose for domestic use. The high import price of sugar puts the imported product out of reach of consumers. A feasibility study has not been carried out, however, and this project might conflict with proposals to produce honey for the local market.

4.2.12 As stated earlier, not much expansion overall can be expected in tea output, which has already stagnated at around the same level since 1977, and thus in tea processing. New factories may be required, however, to cater for expected increases in smallholder output in Mulanje District and for estate production near Kavusi.

4.2.13 One possibility which has been discussed is the production of tea seed oil. This has been under study by the Tea Research

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1/ See the discussion by John Harris, 'Driving Malawi into the Future', The Malawi Review, Vol. 1, No. 1, 1982.

Foundation of Central Africa, which shows that high quality oil can be obtained. The economics of this use of tea are highly uncertain, however, and it is likely to be much more efficient to obtain oil from other crops.

4.2.14 It is anticipated that rice production in Malawi will increase substantially, despite the unclear economics, with a corresponding increase in rice processing. This is at present carried out by National Oil Industries Limited (NOIL), owned jointly by ADMARC (50%), MDC (30%) and Press (20%). Average capacity utilization during the 1970's has been quite low, however, with percentage utilization in the years 1973-1977, equal to 82, 73, 39, 49 and 49. Further capacity will be needed if the optimistic projections being made are realised, but this appears uncertain.

4.2.15 In discussing agro-processing industry it should not be forgotten that the staple food crop in Malawi is maize, most of which is processed into maize flour before consumption. While a substantial amount is still hand-pounded, there are very many small village maize mills (diesel-powered, with 10-20 HP engines), and the numbers are increasing. Custom milling of maize and other products is carried on at village level. This is yet another area where small-scale industry has been effective, particularly due to the dispersed nature of raw material availability and of demand (urban demand still represents a relatively small proportion of the total compared to many other countries) and there is therefore no need for additional large-scale processing facilities. Whether existing rural processing capacity is now adequate, or expanding satisfactorily on the basis of private initiative, or would benefit from encouragement through additional credit facilities requires closer investigation.

4.2.16 Processing of fruit and vegetables in Malawi is limited at present to the canning of pineapples by ADMARC's Mulanje Cannery. Unfortunately the supply of pineapples is highly peaked seasonally, while supplies of other items are not currently available. As a result lack of capacity in the limited pineapple season causes large quantities of fruit to be turned away, while the cannery suffers from excess capacity at other times, raising overhead costs per unit. Expansion of the cannery to deal with the first problem would thus aggravate the second, unless additional lines can be developed. Other problems include the supply of cans, particularly since the can-

making factory at Liwonde closed recently, and a need for modernisation of the ADMARC cannery itself. There are also marketing problems. This has led to increasingly marginal financial viability. Suggestions have been made for the development of pineapple juice and other juices. While there is potential for smallholder production of citrus and mango, some core estate production is probably needed to serve as a foundation in establishing a basic throughput as smallholder supplies are developed. The Mulanje cannery demonstrates the possibility of basing the activity on smallholder supplies: more than 1,000 smallholders in the Mulanje area are engaged in pineapple production, receiving technical assistance from an agronomist attached to the cannery.

4.2.17 Press Holdings has already imported machinery for the processing of lentils into dhall, eaten mostly by the local Asian community, as well as preparing and packing some 6,000 tons per annum of lentils, chick pea, pigeon pea and black and green gram for export. Taking into account existing Asian-owned capacity in dhall production and the quite limited domestic market for dhall, this project may be considered a somewhat risky venture. ADMARC already exports lentils (about 4,000 tons in 1977, the year of highest supply) and total available supply may be well short of what Press anticipates unless smallholder production can be expanded considerably.

4.2.18 As already mentioned, the development of the rubber estate at Nkhata Bay is expected to yield some 3-5 million pounds of rubber at full development. This rubber would be processed as ribbed smoked sheet and crepe. This is at present imported, but after satisfying this demand it would still be necessary, and desirable, to export the bulk of the output. The export market for ribbed smoked sheet in neighbouring countries, and further afield is considered good. A simple factory already exists on site, but there is a proposal to substantially expand and upgrade this: Press Holdings has acquired a 49 per cent shareholding in Mandala Ltd., and a CDC loan will further assist development. Processed rubber is already sold to a tyre retreader and rubber goods manufacturer in Malawi. Proposals are confined to the immediate project site and are for an area of some 1,100 to 1,200 hectares by 1985, yielding 3-5 million pounds of rubber by 1996/7 at maturity of the trees and project.

4.2.19 There is already some production of tung oil by ADMARC at Mzuzu for export, and there may be scope for some development of the industry through substitution for tallow, at present partly imported for use in soap making. There could be significant savings of foreign exchange.

4.2.20 A proposal exists for solvent extraction of vegetable oils, partly from oil-bearing seeds like sunflower, at present exported, from cottonseed cake, and from other oil-bearing raw materials such as maize germ, at present wasted or fed to cattle. Existing cottonseed oil extraction methods by mechanical screw press are relatively inefficient, leaving a significant per cent of oil in the cake which, rather than being nutritive, may be detrimental to the feed. Oils obtained in this way could help to reduce current imports of neutralised vegetable oils valued at K1 million and be used in produced margarine. It is considered also that such a process if applied by Lever Bros., who crush groundnuts for oil, could increase production by about 20 per cent. UNIDO has recommended making available a group of experts to draw up a project document.

4.2.21 A proposal for re-cycling of lubricating oil may be mentioned here, even though the commodity is non-agricultural, since it also represents a means of economising oil of some kind. As a recent UNIDO Programming Mission reports, the MDC is seriously considering a project to re-cycle lubricating oil. The UNIDO Mission recommend that a feasibility study be undertaken with a view also to identifying the most suitable technology. It may be noted that even if the original oil is imported, re-cycling the used commodity represents use of a local resource, substituting for further commodity imports.

4.2.22 The promising development of guar beans in the Shire Valley was discussed in Chapter III. Processing possibilities exist and an American company, Celanese Polymer Specialities Company, has shown an interest in helping to establish a splitting plant.

4.2.23 As already stated, the scope for development of cashewnut production in Malawi appear circumscribed, if not yet fully investigated at the smallholder level. However current processing facilities in Tanzania and Mozambique are generally based on throughputs of some 10,000 tons of raw nuts (requiring some 10,000 hectares of trees),

and this appears out of the question in Malawi. The possibilities for processing in Malawian nuts in Mozambique needs to be checked.

4.2.24 Assuming the production of macadamia nuts can be expanded as planned, however, there will be a need for processing plants. At least two large industrial-sized plants would be needed by 1990, one at Naming 'ombe (sharing common infrastructure with the tea processing plant and a tung oil extraction factory) and one in the north, adjacent to the ADMARC development at Mzenga, together with a number of smaller plants depending on the volume and distribution of smallholder production.

4.2.25 In addition to forward linkages stemming from agricultural production in the form of first-stage agro-processing industry and second-stage industries using processed raw materials, there are important potential backward linkages related to agriculture in the form of supply industries, supplying inputs, packaging and equipment. In the case of Malawi the most important items to consider are fertiliser and pesticides among inputs, cans and woven propylene bags under packaging, and various agricultural implements, together with ox-carts as equipment.

4.2.26 A fertiliser plant for producing fertiliser by water electrolysis has been under active discussion for some time. A report submitted by UNIDO in February, 1980 (MLW/80/015), recommended the installation of a plant with capacities of 120 tons per day of ammonia and 360 tons per day of calcium ammonium nitrate. Estimated project costs amounted to K56.7 million with a foreign exchange component of K50 million. Press Holdings is interested, and the potential demand for electric power of 70 MW is very attractive to ESCOM. A World Bank assessment has been less optimistic, however, and the project currently hangs on the outcome of discussions with a Canadian company which has shown interest. The aim is to use off-peak electric power and the feasibility of the project turns on what is considered to be the economic price of power. The supply of off-peak power depends on the extent of total capacity which in turn depends on the availability of other major electricity-using projects. It is this which is highly uncertain, as discussed earlier. The potential importance of the project for the future, given the need to raise agricultural productivity, particularly of maize, with the help of fertiliser, is obvious.

4.2.27 The UNIDO Programming Mission gave support to a proposal for a pesticide formulation and packaging plant. At present all pesticides are imported as formulated end-products. Prices are high and delivery unreliable. It is thought that a local plant could use domestic resources in the form of mineral diluents, which are locally available. These form a substantial proportion, three-quarters or more by weight, of the formulated end-product, so that would be savings in transport as well as in purchase costs, while the value added in formulation can equal 40 to 100 per cent of the cost of materials used. Possibilities exist for linked industries such as the exploitation and processing of mineral fillers. High returns to the application of pesticides in agriculture are considered to be attainable. One uncertainty, however, is whether the domestic market will be sufficient to sustain a minimum-sized plant.

4.2.28 One input-supply industry which it has been attempted to establish is the production of cans, required potentially for fruit and vegetables by ADMARC at Mulanje and for fish. A major difficulty faced by the fish cannery at Salima has been the shortage of cans, and requirements could increase significantly if fish farming were developed as a commercial enterprise. Local paint producers and a number of other local industrial enterprises also provide some demand. In the absence of local production cans have to be brought from Durban at considerable cost compared to the sheet metal used for manufacture, substantially increasing the cost of exported canned products, reducing competitiveness abroad and taking away the resource advantage of canning local products.

4.2.29 The plant established to make cans at Liwonde unfortunately proved not very successful and recently closed down. The choice of location has been criticised, and there have been managerial problems. The difficulties resulting for the plant's customers were exemplified in 1978 when the ADMARC cannery had fulfilled only about 10 per cent of an order for 720,000 cans and was forced to secure emergency shipments by air from Durban at high cost. It appears that the Liwonde cannery, a relatively small can-making plant, did not operate on anything like the scale required. Given the dependence of any kind of tinned product on a cheap supply of cans, otherwise a useful vehicle for exporting local resources such as fruits, which can be produced by smallholders, or fish, it is important that the most appropriate form of development in this area be investigated again.

4.2.30 A much more important form of 'packaging' than tins, in terms of volume of goods packaged, are bags: three to four million jute bags used to be imported from Bangladesh until quite recently, when Whitehead's established the production of woven polypropylene bags, using imported polypropylene granules. In this Malawi is following a trend in other countries such as Kenya and Nigeria, which have done the same. Given that bags represent a major input into the agricultural sector it will be vital to ensure that the cost of bags delivered for use does not increase as a result of this change. While Bangladesh in effect subsidises her own export production of jute bags, so long as the subsidy is maintained it represents a benefit to Malawi, unless Malawi itself is able to supply bags still more cheaply.

4.2.31 The most obvious inputs into agriculture are farm implements of different kinds. It is clearly important to see to it that Malawian farms are equipped with the tools required and also that the level of technology is raised over time. This hopefully will be made easier if economic domestic manufacture of implements can be established. Conversely the existence of a large agricultural sector may provide the opportunity for backward linkages into agricultural implements supply.

4.2.32 The two substantial producers of farm implements in Malawi are Brown and Clapperton's, a private company, and AGRIMAL Ltd., owned 40 per cent by MDC, 40 per cent by Press Holdings and 20 per cent by Massey Ferguson. The latter produces mostly animal-drawn single-furrow ploughs, with 8-inch shares, and hoes. Capacity, which is for 15,000 ploughs, 10,000 ridgers and a million hoes, is seriously under-utilized, peak sales having been just under 7,000 ploughs of different kinds in 1979 and 790,000 hoes in 1974, the first year of production (Table 4.3.4). Alarmingly, production of ploughs fell to under 900 in 1981, in two years. The output of hoes has been maintained at a reasonable level of 540,000 (in 1981) but has not expanded.

4.2.33 There are a number of reasons for this. There is, first of all, the loss of export markets. Large numbers of hoes used to be exported to Zambia and Mozambique and, while the former decided to establish its own plant (illustrating the need to achieve a higher degree of economic cooperation among SADCC countries), Mozambique has suffered from a shortage of foreign exchange. Whether Malawi itself has a comparative advantage here can be questioned in any case, since it is dependent upon imported steel from Zimbabwe, which

has its own production capacity. Similarly, production of ploughs in Blantyre requires protection against deliveries from the Bulawayo factory.

4.2.34 More fundamentally, out of a million farmers in Malawi, only a fraction use ox-powered equipment, as is evident from the level of sales. In the Shire Valley and in Lilongwe District about a half per cent of farmers use oxen and less than one per cent of farm areas are under ox-cultivation. The main District for ox-cultivation is Karonga, where rice is produced, and 60 per cent of the land is ox-cultivated (Table 4.2.5), together with Rukuru/Upper Kasitu District which has 23 per cent. There is negligible use of tractors. The increasing scarcity of land in the southern region suggests that it will be quite difficult to promote ox-cultivation there. Here and elsewhere cultivation of hilly terrain makes adoption difficult. Women farmers, who constitute a large proportion of the total, have special difficulty in using ox-drawn equipment.

4.2.35 This emphasises the need to focus on the distribution of hand equipment, and the decision by AGRIMAL to move into the production of cutlasses (pangas) is overdue. This additional activity should help to spread overheads.

4.2.36 One factor limiting sales of hoes despite a selling price of just over two kwacha, is the low level of purchasing power in the rural areas. Because of this, many farmers prefer to buy inferior hoes produced by village blacksmiths. 'Almost every locality' is said by AGRIMAL to have a capacity for producing hoes at the village level, capable of turning out up to one hundred a day. Ironically, the cores of broken AGRIMAL hoes can be used again, together with blades cut from scrap metal and handles also made in the informal sector by local carpenters. While these may last half the time of a new AGRIMAL hoe, just one season, they can be bought at 50 tambala, a quarter of the price and are therefore an economic purchase: another example of effective informal sector competition with the formal. This village industry is estimated by AGRIMAL to produce 75,000 to 100,000 hoes a year, or one-fifth of the national market.

4.2.37 The limited use of ox-ploughs in Malawi implies a narrow base upon which to develop improved agricultural technology. Nevertheless the Ministry of Agriculture has a Farm Machinery Unit at

Chitedze, near Lilongwe, which is attempting to develop and test appropriate machinery and hand-operated tools. There is good cooperation between the Unit and AGRIMAL, who have manufactured a new tool bar with a full range of attachments, planning to distribute about a hundred of these this year. A variety of promising implements have been developed which could eventually have an impact, despite the constraints mentioned, particularly a multi-purpose pedestrian tool frame incorporating plough, ridger, cultivator, groundnut lifter (at present of interest only to richer farmers) and, it is planned, a planter.

4.3 Livestock-based industries

4.3.1 As stated in a previous section, Malawi does not have a particularly wide base for for developing livestock-related industries, but a number of such activities and industries are of considerable potential importance to the economy. We can examine meat processing (abattoirs) and dairy processing; the animal feed industry; tanning, as a first-stage industry, and second-stage leather-using industries such as shoe production and travel and craft goods.

4.3.2 For meat processing two abattoirs exist, one established in Blantyre since 1960 and another in Lilongwe since 1971, with a capacity to slaughter 120,000 head of cattle, over 30,000 pigs and a large number of sheep and goats on a one-shift basis. This capacity is still only lightly used: for instance in 1978 CSC slaughtered 8,500 head of cattle, just 7 per cent of capacity. The underlying factor here is the low level of controlled meat prices, severely restricting supply to the two urban areas, at the same time rendering slaughter operations highly unprofitable. Even if this policy were adjusted, however, there would be no need for additional processing plant in the central and southern regions.

4.3.3 An existing pilot dairy plant in Blantyre buys some 1,200 gallons (5,440 litres) of milk daily, three-quarters from smallholders. However a detailed plan exists for a new processing plant for the Blantyre area with a capacity of 27,000 l., about five times as great as this. This factory would also turn out various dairy products. The need for additional production of milk and milk products is apparent, with $5\frac{1}{2}$ million pounds of dairy produce imported annually, and unsatisfied demand in existence in both urban and rural areas. But it seems doubtful whether this can be supplied from domestic sources for some time to come, during which Malawi will continue to depend on imported milk ingredients.

4.3.4 There are two problems. First there is the underdeveloped resource base, with cattle still being raised by relatively few people. There is a need for more aggressive efforts to develop smallholder production throughout the country, not just in the urban areas, for self-consumption and sale to neighbouring rural households. Secondly there is a problem of low price incentives to producers, which would be much more easy to correct. The fact that the producer price is

only 31-36 per cent of the whole milk retail price[1/] means an incentive to sell locally within the rural area in order to avoid this substantial margin. Under the price control legislation whereby the Ministry of Trade and Industry establishes wholesale and retail milk prices these also tend to rigidity, so that while the cost of living increased by 38 per cent over the period 1976-79, milk prices increased by just one per cent.

4.3.5 The need for a tannery is fairly clear. Malawi is currently exporting raw hides and skins (mostly to Greece) and importing all leather requirements for its limited leatherworking activities. A feasibility study for a tannery and related leather-working industry was carried out in 1978 by Gesellschaft für Organisation, Planning und Ausbildung (GOPA), concluding that the project was indeed feasible. The recent World Bank evaluation supported this conclusion, though on the basis of a somewhat modified project, involving an integrated approach with improvement in the hides and skins collection system and training assistance to the local leatherworking industry. MDC and INDEBANK have shown an interest in the project.

4.3.6 Viability will depend primarily on securing an adequate inflow of hides and secondly on finding adequate outlets for the leather. Approximately 80,000 cattle hides or their equivalent are taken as required for a small economically viable tannery. This could be satisfied by an intake of 60,000 hides and 75,000 skins (the recommended full capacity for one shift working). GOPA grossly overestimate the number of hides likely to be available by 1985 at 101,000, on the basis of simple extrapolation of growth rates. The estimate of 67,000 by the IBRD team is much more realistic, being based on an estimated national herd of just over one million in 1985, a 10 per cent off-take rate (the historical rate) and a 66 per cent rate of collection by commercial channels. The figure is not too far distanced from the 45,000 hides and 47,000 skins actually collected in 1977, for instance.

4.3.7 In fact the collection of hides in Malawi is constrained by two factors: (a) the number and distribution of hide sheds

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1/ IBRD, Agro-industrial Report, 1979, Table 102.

throughout the country and (b) the unfavourable system of prices.

4.3.8 About 100 hide sheds have been established in Malawi, these run by the CSC assisted by the Department of Veterinary Services (DVS). But their location has been determined historically by the distribution of DVS slaughter centres. With the much more rapid increase in the cattle population in the south (nearly 8 per cent compared to 3-4 per cent in the central and northern regions), the ratio of sheds to cattle there is much lower. Collection is further hampered by staff shortages in CSC, and it is reported that hides can sometimes be at government stations for a long as a year. For these reasons the World Bank report recommends expansion of the collection system, to be run now by the tannery itself, as a means, hopefully, of generating a more aggressive collection policy.

4.3.9 As in the cases of meat and milk, prices of hides and skins have suffered from price control rigidities: prices paid to butchers had been unchanged for five years in 1981. Their value having been reduced to no more than $\frac{1}{2}$-1 per cent of the value of the animal, hides are apparently often buried with the offal, while those which are offered may be damaged by careless and hasty skinning, or subsequent handling and storage.[1/] Data provided in the World Bank appraisal suggest that the number of goat skins collected in relation to estimated slaughterings may have fallen from 60-70 per cent in the early 1970's to only 40 per cent in 1977.[2/] The system of prices is thus both inequitable (CSC make substantial profits from the resale of hides and skins) and inefficient. The extent of inequity is shown by the following figures:

	Hides	Skins
Average CSC purchase price	1.00	0.25
Collection costs (assumed not more than 35% purchase price)	0.35	0.09
Sale price, Lilongwe	8.00	2.00
CSC profit	6.65	1.66

These improvements, in collection and in pricing, are desirable even if Malawi simply continued to export raw hides, for which there is a ready export market.

1/ IBRD, Agro-industrial Development.

2/ IBRD, 1979, Table 93.

4.3.10 If the first-stage industry is leather production, a further question is the extent to which this can be substituted for imported leather in existing second-stage industries or can provide the basis for new second-stage industries using leather as inputs. Either possibility would produce an increase in manufacturing value added.

4.3.11 Existing leather-based industries are essentially two, the Bata Shoe Company and the Leather and Luggage Manufacturers, Blantyre, making suitcases, briefcases, and other items. Per capita consumption of shoes in Malawi is approximately 0.35 pairs per person per annum, quite low compared to the figure of 1.0 for developing countries as a whole.[1/] Bata started shoe production in Malawi in 1974 with 25,000 pairs, reaching 200,000 pairs in 1977, about two-thirds of the country's consumption of leather-topped shoes, though another 800,000 to a million pairs, mainly with canvas uppers, is produced.

4.3.12 The GOPA study deduces an 18 per cent growth rate in demand from BATA planned production levels of 320,000 in 1980 and 500,000 in 1983 (equivalent to 16,700 hides). This 18 per cent growth rate is then assumed to continue throughout the 1980's, an extrapolation which does not appear legitimate when a major element of import substitution is involved. Consequently GOPA's estimates of the demand for hides by the shoe industry of some 39,000 in 1985 and nearly 89,000 in 1990 (Table 4.3.1) would appear to be a gross overestimate: demand is unlikely to be more than half this level in 1990.

4.3.13 The proportion of potential demand for hides accounted for by shoe production remains constant at about 86 per cent in the GOPA calculations (Table 4.3.1), the remaining potential being in travel goods and curios. At present all genuine leather travel goods are imported, local manufactures being entirely plastic. The GOPA projections, again making use of the 18 per cent growth rate assumed for shoes, once more need to be downgraded. Total consumption of travel goods in leather and plastic was valued at K683,000 in 1977, with leather about 27 per cent of this.[2/] Markets are likely to be

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1/ Feasibility Study for a Tannery and Leatherworking Industry in Malawi, Gesellschaft für Organisation, Planning und Ausbildung (GOPA), 1978.

2/ IBRD, 1979, p. 272.

segmented, particularly the somewhat separate market for cheap plastic products, affecting the amount of import substitution likely to be achieved. Probably no more than half of each of the present leather goods and plastic goods markets would be amenable to substitution by domestically produced leather, leaving a high-income imported leather goods segment and a low-income market for goods of imported plastic.

4.3.14 The demand for leather curios and souvenirs in the GOPA and World Bank studies are based on estimated numbers of tourists coming to Malawi. Again the extrapolations are on the high side: if one assumes a 50 per cent increase in tourist numbers from 1980 to 1985, and a further 50 per cent by 1990, one arrives at figures of 2,250 hides and 11,250 skins required in 1990, compared to corresponding GOPA figures of 5,667 and 28,333 respectively.

4.3.15 One can perhaps conclude, without entering into detailed estimations, that a tannery should be viable from both supply and demand sides, with somewhat greater uncertainty with respect to the demand for leather. In particular, the domestic demand for goat leather should not be expected to reach tannery output capacity until 1986-87.

4.3.16 The only export possibilities considered in the studies are those for curios and souvenirs, which are deemed too uncertain for serious consideration. What appears a possibility is an export market in labour-intensive small leather goods, including handbags and shoulder bags. While other African countries with large livestock sectors, such as Botswana, would appear a more obvious choice for such an activity, it would in fact require an adequate rather than abundant supply of leather, the main constraints being labour skills, which can be developed, product design and market promotion. Such products are already successfully produced in neighbouring Tanzania without yet being effectively marketed abroad.

4.3.17 The other potential livestock-related industry is the animal feed industry. At present mixed animal feed in Malawi is produced largely by the Grain and Milling Company (GRAMIL). The product is based on grain milling, with some question marks on nutritive content, and production is relatively small, amounting to some 10-12,000 tons of prepared feed per annum. About two-thirds of

this is fed to poultry. At the same time about 400-600 tons of fishmeal and premixes per annum are imported, at high prices, while fish residues at Salima Canners and elsewhere are thrown away.

4.3.18 Between GRAMIL and Salima Canners there is more than enough manufacturing capacity to produce current demands for feeds, while plentiful milling by-products are available as inputs, together with protein sources such as groundnuts, cottonseed meal, maize germ and rice bran, with additional supply potential in the form of guar beans and soya beans.

4.3.19 The immediate constraint is on the demand side, with poultry feeding (for urban supply) making up the bulk of what is still quite limited demand. The growth of this industry has been quite rapid, with government encouragement. The greatest need here, however, is to develop the habits of poultry rearing for households' own and local consumption in the rural areas, as a source of protein and enrichment of diet. This would depend, apart from effective extension, on keeping prices of feed very low, the economics of poultry rearing being very directly a function of feed costs. It may be necessary to develop domestic or village methods of low cost production of feed mix.

4.3.20 What will also need to be developed over a period of time is stall-feeding of cattle, for beef as at present, and even more for dairy, where the same cost conditions will be relevant.

4.4 Fisheries-based industries

4.4.1 Processing associated with the fishing industry may be divided into simple drying and preservation, accounting for the bulk of the catch, and fish canning. Backward linkages extend into boat-building and the manufacture of nets and, in the case of canning, to the manufacture of cans.

4.4.2 The requirements of the fishing industry at the production, processing and marketing levels were discussed earlier (Section 3.4). The IBRD report on Agro-Processing identifies as desirable a fish production, processing and marketing project which would aim 'to further develop the fish production, processing and marketing system in Malawi'. This would widen the production base by completing the assessment of the northern fishery, and developing this, and by expanding fish farming. Fish processing and marketing would be improved by (i) providing additional icing points and fish preservation centres, (ii) giving assistance to Salima Canners, and (iii) through an expanded credit programme for fishermen, processors and traders.

4.4.3 The programme of credit which is required by the industry would include assistance to fishermen for boats, engines and nets, to processors for wet weather drying equipment, to traders for insulated boxes and transport, and to retailers, to develop sanitary fish handling premises.

4.4.4 So far the credit needs of the industry have so far scarcely been touched. The Fisheries Department is active, but quite small, and short-staffed. Assistance to fishermen in the acquisition of boats and directly to boat-builders is particularly required, including the suggested priority access to limited supplies of mulanje cedar.

4.4.5 Apart from the 'informal sector' beach processors, two parastatals, MALDECO Fisheries and CSC, the Cold Storage Company, are involved in commercial processing and handling of fish, as well as two private companies, Lakes Fisheries and Salima Canners.

4.4.6 While the Salima fish cannery is quite small, its fate is of some importance to the future of the industry, as its collapse would not augur well for the prospects of any additional canning capacity in the industry. Its attempts at securing export markets, together with the existence of substantial imports of tinned fish for low-income rural and urban markets, make its fortunes something of a test case. While its chequered history reflects a series of dislocating extraneous events, these represent the facts of actual existence rather than the theory of project appraisal.

4.4.7 The main products marketed have been canned utaka in tomato sauce (the latter recently made from local produce) and pet food. After the commencement of operations in 1974/75 most of the cannery's output was exported, up to 1977/78, with peak export sales of K48,000 in 1976/77 (Table 4.4.1). In 1978/79 exports fell off before ceasing altogether the year after. Sales were maintained till 1980/81 almost entirely as a result of sales to the Malawian army and police. Given the 'captive' nature of this market, it may be said that the cannery has still had no success in securing a position in the domestic market (in addition to losing its export market).

4.4.8 In view of a current proposal to expand the cannery, with possible MDC participation, the obvious question is whether the problems encountered to date were of a non-repetitive nature or are likely to recur, the three major problems being those of fluctuating supplies of fish, unreliable supplies of empty cans, and untimely availability of tomatoes.

4.4.9 In the dry season fish become difficult to purchase from local fishermen, who prefer to sell to other traders catering for the substantial local demand for dried fish: presumably reflecting a willingness on the part of the rural public to pay during the period of seasonal shortage higher prices than the cannery would wish to meet. This is likely to remain a problem with any expanded enterprise unless more capitalistic methods of fishing succeed in regularising supply and widening the range of fish sources, or the scope of canning can be broadened to cover other varieties of fish (for instance usipa, which is already canned in Harare) or fruit and vegetables. The proposal/prefeasibility study for an expanded cannery put forward by Salima Canners assumes annual purchases more than ten times greater than the highest historical level of sales measured by weight, and is thus highly questionable.

4.4.10 Cans were obtained from Zimbabwe until the border closure in 1976, and later from South Africa (which proved expensive and unsatisfactory) and from the can-making factory at Liwonde, which has recently closed. The possibility of reverting to Zimbabwean supplies suggests that this quite critical problem should be capable of resolution. Prospects for the can factory were considered earlier.

4.4.11 The use of locally grown fresh tomatoes and onions in 1980 significantly improved the product. The difficulty here is that the peak period of tomato and fish availability do not coincide, supplies of tomatoes and onions being very scarce during the four-month wet season, when processing is halted. This problem would remain with any canning operation, but it should be possible to produce and store tomato paste at the plant, and the alternative also exists of using imported paste and onion powder.

4.4.12 Scope also exists for the production of fishmeal, already being carried on successfully at Naimasi, near Mongochi, by the Fisheries Department. At present some 400 to 600 m.t. of fishmeal is imported annually by Malawi, and there is a ready market. This would be a valuable means of turning waste products into revenue.

4.4.13 The canning company's operations to date have been highly erratic. Some of the factors responsible are of a non-repetitive kind or of the nature of 'teething problems', to be considered establishment costs in a new project involving a number of unknowns. Clearly, though: (a) despite the existence of potential local and export markets for tinned products, local demand for fresh and dried fish simply processed (together with exports in this form) is likely to absorb the bulk of available supply and, indeed, deserves this priority; (b) even this single project for the expansion of Salima Cannery must be deemed high-risk, and scope for a major fish canning industry in Malawi does not appear to exist, in the absence of new sources of supply such as fish farming.

4.4.14 There may, however, be significant potential for export of higher-priced fish such as chambo in simply processed form especially, again if supply can be expanded.

4.4.15 It needs to be emphasised that canning is only one part of the fish processing industry, even of fish processing for export, and very much the smallest part. The main processing industry in Malawi,

which should have the highest priority for improvement and development, comprises smoking and drying by traditional processors. The substantial scope for improvement of this industry has been indicated.

4.4.16 Apart from boats and engines, the other capital item involved in the production process is the net. A resource-linked industry already exists here, in the form of Blantyre Netting Company, a subsidiary of Whitehead's, the textile manufacturers, who are contemplating a doubling of their capacity. Sales of fish nets in Malawi amounted already in 1978 to 28,000, or 2.8 million yards of netting. In this respect the position of the Malawian fishing industry is an exceptionally healthy one, with most single boat owners possessing some 5,000 yards of gill nets and some larger owners as much as 15,000 yards: a sharp contrast to the extreme shortages current in neighbouring Mozambique and Tanzania, and in Zaire. Despite this, supply is well short of demand, leaving the Netting Company with large unfulfilled orders, and the proposed expansion of capacity should well justify itself in financial as well as developmental terms. Further demand will depend on the development of the central and northern fisheries.

4.5 Forest-based industries

4.5.1 The organisational structure of the Department of Forestry, which falls within the Ministry of Natural Resources, is well geared to the promotion of forest-based industries. It comprises five divisions, including Forestry, Management and Services, Viphya, Forest Industries and Wood Energy Divisions. Viphya Division is responsible for the management of the Viphya resources, while the Forest Industries Division is responsible for the collection and conversion of logs into sawn timber, the manufacture of wooden products, and the supply of treated transmission poles. Once the Viphya Division of the Forestry Department has delivered timber to the roadside its use becomes the concern of a statutory public corporation, the Viphya Pulp and Paper Corporation (VIPCOR), originally established primarily in connection with the proposed pulp industry.

4.5.2 In considering potential forest-based industries it is useful to keep in mind those which will utilize the Viphya resource and those using other resources, and this will be done as we proceed. The ODA Viphya Utilization Study considered five separate forms of utilization, pulping, saw milling, plywood veneers, and chemical manufacture, and (from eucalyptus) transmission pole production, to which charcoal production might have been added.

4.5.3 Malawi already possesses seven saw mills. Easily the largest is that run by the Imperial Tobacco Group, in connection especially with their business as tobacco merchants and packers. Its output of 17,382 m^3 in 1979 accounted for about 37 per cent of total output (Table 4.5.1). This, together with the output from three publicly-owned sawmills run by the Forest Industries Division, made up about 90 per cent of total production, estimated in 1979 at 46,569 m^3. Imperial Tobacco also own a veneer and plywood plant, while there is a small, privately-owned match factory near Blantyre. The sawmills at Zomba and Dedza produce from softwood structural grade sawn timber for building purposes, and boxwood. At present about half the timber sawn is softwood (pine and cedar), and the rest hardwood.

4.5.4 According to World Bank estimates, the demand for sawn timber exceeds supply by a substantial amount, while the prices of domestic timber are well below import parity. It is expected that demand will about double over the next 20 years (Table 4.5.2). Additional capacity could be based on the Viphya resource, to supply timber and poles for

the Northern Region, but the main project identified is on the Zomba plateu. This would replace the existing mill of 0.6 million cubic feet input capacity with a new one of double that size. Softwood supplies available from Zomba forest would more than sustain this, and the mill would be in a good location from which to fulfill the requirements of the greater Blantyre/Zomba area. The ODVA Viphya Utilization Study recommends a sawmill for Viphya, of 28,000 m^3. Both suggested sawmills would appear viable, with priority for expansion at Zomba near to the main source of demand.

4.5.5 Average annual imports of blockboard, plywood and veneer increased at just below 8 per cent per annum over the period 1968-70 to 1977-79, and overall consumption, including local production, at over 17 per cent per annum.[1/] Very little particleboard is used in Malawi, unlike other countries, and demand is overwhelmingly for plywood. This demand is buoyant, and expected to increase by two-thirds over the ten years to 1990.[2/] Local production has lagged behind demand. Plywood is used in a great many ways for furniture, sub-flooring and sub-roofing, for walls, panelling and partitions, for packaging and outside for decking and construction site fencing. In Malawi some 40 per cent is used in tea, tobacco and other packaging (particularly tea) and thus represents an export. One uncertainty is whether there would not be advantages in going for particleboard production in preference to plywood but, as argued presently, there are good reasons for concentrating on plywood production to begin with.

4.5.6 The mill would need to be located at Viphya, the only area where there would be sufficient raw material supply. The numbers of suitable trees still needs to be determined precisely, but the Ministry have estimated some 6,000-8,000 m^3 to be available.

1/ ODA Viphya Utilization Study, p.29.

2/ ODA Study.

4.5.7 Although consumption of panel products in Malawi remains dominated by plywood, both the IBRD and ODA studies question the desirability of this. As the IBRD states, 'Plywood... is clearly the most popular brand of panel board (in Malawi) with the fastest rate of growth in recent years. But... substantial technical and economic substitutability is possible between plywood and other panel boards, including particleboard. And particleboard can be readily produced from available waste wood and sawmill wastes in Malawi, thus avoiding the necessity of utilising virgin trees that are intended to be used elsewhere'.[1/] Present demand for particleboard in Malawi is very small compared to the smallest viable size of plant, however, so that viability would depend entirely on substitution for plywood, something which must be considered highly uncertain at this stage. Indications are that acceptance by panel board users would be low. Another factor is that the special demand for plywood for tea packaging, a significant portion of the total, would not be substitutable, although there is a possibility here of switching to cardboard packaging. To the extent that this would reduce the overall market for panel products it would reinforce the need to see the two types of production as alternatives. At the same time the increase in the volume of sawn timber projected for the future implies a substantial increase in the volume of waste products available, and the possibilities of their use in particleboard or other products need to be kept in mind.

4.5.8 Present production by the Match Company (Malawi) Limited has made Malawi self-sufficient in matches, but because splints are imported from the company's parent in South Africa, value added is low. The Forestry Department has planted suitable trees at Mulange, but these will not yield timber until the early 1990's. Given the shortage of foreign exchange and the need to increase local value added, the case for making do with a lower quality splint should be reconsidered with a view to following the example of Zambia, where the same company has been induced to adopt lower quality P. kesiya splints. Unfortunately demand for matches is likely to continue to be limited to the home market, due to the existence already of import-substituting plants in Zambia and Kenya, and strong South African competition in the BLS

1/ IBRD, 1979, p. 312.

countries.

4.5.9 One of the obvious possibilities, given the huge pine reserves, is the production of naval stores, gum, wood and tall oil rosin and turpentine. Trees within five years of felling would be the ones tapped, without affecting their subsequent planned utilization. The domestic market in Malawi would be small: one of the major uses of rosin is as size in the paper industry, not yet established in Malawi. Export possibilities exist, however, as rosin has a fairly high value per unit weight compared especially to other timber products, so that transport costs should not be a barrier, especially if export quantities of sufficient volume can be achieved. There is a world shortage of gum rosin and turpentine, which compete with oil-based products in a number of uses, where prices are rising. A further advantage is that the tapping process is very labour-intensive, giving Malawi a cost-advantage over the traditional producing countries, and creating employment. One uncertainty is the effect of altitude on oleorosin flow. Tapping trials have been started and it will be necessary to await the outcome of these. The quantities of suitable slash pine available, however, are limited.

4.5.10 The extent of further processing of gum oleorosin is another matter. While this can be simply distilled into rosin and turpentine, excess distilling capacity already exists in a chemical plant in Zimbabwe (Harare) which could absorb all output in the early stages: domestic capacity could be established subsequently. Further processing of rosin and turpentine into other constituents is not likely to be economic, however, as this is capital-intensive, with substantial scale economies.

4.5.11 Charcoal is not much used in Malawi, as already mentioned. This is surprising, perhaps, in the light of the cold season which exists. It has obvious advantages in terms of heating facility and ease of storage. Reduced costs of transportation relative to fuelwood have to be compared with production costs for making charcoal. Estimates suggest a breakeven point here somewhere between 30 to 50 miles, return journey.

4.5.12 Different potential supply areas have been considered. One possibility referred to is the use of areas of indigenous forest land in process of transformation to industrial plantations and the remoter indigenous forests being taken over as forest reserves, which

would not otherwise be exploited. At present some 1,160 ha. per annum of indigenous forest are cleared for conversion to industrial plantations and the wood lost due to distances to market points. The ODA study sees the Viphya forest as a massive potential raw material resource for charcoal production, though acknowledging that doubts have been expressed over the carbonisation qualities of pines.

4.5.13 The problem in both cases may be one of distance from areas of market demand. Viphya is at a particular disadvantage here, with the main market in the Southern and Central Regions. The possibility of Viphya supplying charcoal to the cement workds at Kasungu has been mentioned: this particular market for energy, however, appears destined already for electricity supply through ESCOM and can be excluded. For the Southern or Central Region markets, transport cost would be prohibitive.

4.5.14 Nevertheless a project is identified by the IBRD using wood from areas being converted to industrial plantations. This would comprise ten charcoal production units made up of nine simple brick kilns of an improved type, altogether yielding a production capacity of some 11,000 metric tons per annum from 970 ha.

4.5.15 It is not clear who would operate these units, though **the suggestion is that they would be run by the Forest Industries Division. An alternative would be to licence private small-scale enterprises, offering credit and technical support. This would have the advantage of generating a more flexible and permanent producing capacity with closer knowledge of markets for the disposal of the products. There is a need for more general assistance to upgrade charcoal production, the traditional pit kilns which are in use being particularly inefficient in conversion. These developments could be undertaken, if approached with some care.**

4.5.16 **It must be emphasised that, in addition to providing building poles for construction, and door frames and windows, the forest sector provides the basis for a widespread small-scale furniture-making industry. This is a further important reason for continuing to ensure supplies of wood.**

4.5.17 Apart from this there is a possibility eventually of developing a productive capacity in knocked-down pine furniture. Both the Republic of South Africa and Zimbabwe have since the late 1970's become significant exporters of such furniture for the do-it-yourself, chain store and mail order markets. Malawi would, of course, be at a substantial transport disadvantage but this may be something for the future as transport facilities improve.

4.5.18 Malawi already has a furniture industry, of course, comprising the large numbers of small-scale urban and rural carpenters which exist to cater for the needs of the mass of low-income consumers. This activity operates under a number of serious constraints, however. The most fundamental is the lack of purchasing power in the rural areas. A statement made not very long ago was that 'Doors, windows and shutters were relatively uncommon in the rural areas and were obvicusly status symbols', and that 'very little furniture was usually found in the villages, and that which was there was made by the village carpenter'.[1/] The other important limitation is supply of materials. Apparently many carpenters would like to buy Dedza Pine but find transport of the wood from the stockyards a major problem. Specifically 'logs cut "through and through", even if they were short would find a ready market with many of the carpenters, largely on the basis of price but also availability. Both plywood and hardboard were also in demand but again transport from the depots to the villages presented a problem'.[2/] This suggests the need for some kind of materials supply scheme which would bring the wood nearer to the carpenter, perhaps with a credit component, while avoiding an expensive delivery system. This should not be limited to recent graduates of Salima Trade School, who are small in number, and a pre-requisite may be some organisation or at least survey of the industry, with registration of carpentry enterprises and an assessment of precise requirements. This is made more important by the progressive depletion of the forests which has been affecting carpenters with increasing severity for some time.

4.5.19 One interesting related activity which is carried on by a nucleus of skilled artisans, particularly in the central part of the

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1/ F.A.O./SIDA Seminar on Forestry Social Relations for English-Speaking Countries in Africa and the Caribbean, Rome, 1-26 April, 1974, p. 155.

2/ Ibid, p. 155.

country, is the production of ox-carts. Here they are obviously valuable inputs into agriculture and the rural household economy in general (including transport of fuelwood) and are well made, fetching high prices. These are comparatively rare in East Africa to the north (Zanzibar is one exception) and therefore represents an asset in Malawi which might be developed, even if shortage of grazing for oxen may limit this in the south. Price will constrain effective demand, but the potential needs to be assessed.

4.5.20 Further potential products of the forest sector are honey and beeswax. The IBRD study puts forward a proposal for a two-stage project starting with commercialised production up to 125 metric tons of honey, supplemented by a village beekeeper programme to yield an equivalent amount. Apart from the domestic market in Malawi, there are good possibilities for export to Zimbabwe, which imports 400 tons per annum, and Europe where Germany, for instance, is a major importer. Tanzania, nearby, has successfully exported some 700 metric tons per annum over a long period. The export demand for beeswax is also buoyant.

4.5.21 Preference for a commercial project of this sort is based in part upon scepticism regarding the present technical capacity and interest of village beekeepers, and on the low productivity of traditional techniques relative to the requirements of a proper marketing system. In fact records show beeswax exports from Nyasaland of 52 tons as long ago as 1906, while an extension campaign started in 1965 was able to secure some response before it was closed down, it would seem prematurely, in 1968. The limited response may have something to do with the current ADMARC price of 14 t/lb., just 9 per cent of the retail price of 159 t/lb. and 3½-4 per cent of the retail price of imported honey. It should be noted that Tanzania's production has been achieved through village beekeeping, though developed over a long period of time. With proper price incentives and organised technical assistance and marketing, a viable small industry could be developed. Some commercial production would, however, act as a useful catalyst to this end.

4.5.22 Two more ambitious developments based on wood which are considered in the ODA Study are the production of fuels and chemicals. Those items currently being imported which it is considered might be produced are petrol/gasoline, LPG and methanol and, among chemicals,

nitrogenous fertilisers, polyethylene, pine oil, solvents, detergent, cellulose, ammonia, lacquers and resins.

4.5.23 The bulk of chemicals in use in Malawi, with its limited industrial base, are nitrogenous fertilisers. Over the period 1977-79 imports of fertilisers averaged 88,000 metric tons, about 60 per cent of this ammonium sulphate. Fertilisers are in part blended and granulated in Malawi. The ODA Study suggests that an ammonia plant of some 53,000 tons per annum capacity might be feasible, based on Viphya resources. This still needs to be substantiated.

4.5.24 The same study points to the considerable amount of research and development effort which has been devoted elsewhere over the past ten years to thermal processing of biomass in order to obtain gas or a liquid fuel product. It is now technically feasible to manufacture petrol from methanol or gasoline directly from synthesis gas. Accordingly a petrol production plant, using wood gasification techniques, with a capacity of 68,000 tons per annum is suggested. Unfortunately the view of other consultants, Trichem, of the German Federal Republic, is that the effectiveness of the relevant technology has still to be proven industrially and that 'it will be some years before a wood gasification process for methanol production reaches the stage of development needed to provide all the data required for building a commercial plant'. While, therefore, this remains a possibility for the future, immediate progress should not be envisaged.

4.5.25 Another project which has been under discussion is that for a transmissions pole treatment plant. Given the length of Malawi, north-south, such a plant would have a transport cost advantage over alternative supplies to the south in supplying northern Malawi. However this advantage would be reversed in relation to the south and centre of the country, so that it would be necessary to establish the size of this separate sub-market in order to determine feasibility of the plant.

4.5.26 Thus while many suggestions have been made for developing the Viphya resource, the immediate practical possibilities are strictly finite. The original objective of producing pulp for export does not appear feasible or, for the moment, the major alternative of wood gasification for petrol production. The production of ammonium sulphate may be in this category. There will be some usage for fuelwood, but

significant production of charcoal is unlikely to be economic. The production of pine furniture, if Malawi were to succeed in entering this market, would probably not use this particular resource. This leaves open the establishment of a sawmill, to serve the north of the country, a plywood mill, a treatment plant for transmission poles, again serving the north, and the production of naval stores with distillation of oleorosin at a subsequent stage. These would together use only a small proportion of the total resource. As already stated, while possibilities for fuller utilization continue to be explored, it is important for policy-makers and planners in this area to concern themselves less with justifying ex post this investment but to focus action on the critical needs emerging in the area of fuelwood and rural construction supplies.

4.6 Small- Scale and Informal Manufacturing Possibilities

4.6.1 In assessing industrial possibilities it is natural to focus on possible projects, as we have done above. At the same time project appraisal in Malawi, as elsewhere, has tended to be biassed towards medium or large scale projects rather than, in contrast, programmes for small industry development. Large scale enterprises are more likely to be involved where an effort is being made to attract foreign investment, or where parastatal development corporations are used as a principal vehicle for the development of new economic activity, large scale enterprises lending themselves more readily to parastatal participation and control.

4.6.2 In fact Malawi has a thriving informal enterprise sector and a number of quite interesting small-scale industries, together of considerable quantitative importance. Some of these have been mentioned already. Care must be taken not to be misled by official NSO figures of employment in enumerated establishments, which relate only to establishments with 20 or more persons engaged. Official figures for 1975, for instance, suggested that firms with less than 50 employees accounted for a fractional 3 per cent of manufacturing employment. In fact this data covered just 28,000 persons employed in formal sector manufacturing: a more comprehensive census of small-scale informal sector enterprises throughout the country, carried out by the Ministry of Trade, Industry and Tourism in 1977/78, estimated numbers engaged in this sector at over 100,000, if related sectors such as construction and transport are included.[1/] These were well distributed throughout the country, only about 18 per cent of SSE's with paid employees being located in Blantyre or Lilongwe, and 15 per cent of self-employed artisans (Table 4.5.1).

4.6.3 Outside manufacturing as generally defined there were some 500 'commerical' brickmakers, 80 contractors, 1,000 transporters and 1,400 artisans producing handicrafts. Tailoring is the most important activity, as far as employment is concerned. In 1978 this

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1/ Comments on World Bank Consultant's Report, 'Malawi: Small-Scale Enterprise Development', Ministry of Trade, Industry and Tourism, October, 1978, p.2.

accounted for 606 out of 756 small-scale manufacturing enterprises (80 per cent) in Blantyre/Limbe, Lilongwe and Liwonde (Table 4.6.2) and 92 per cent of those 'enterprises' involving self-employed persons. Excluding the self-employed, tailoring accounted for only 14 out of 114 units. The other important manufacturing activities are tin-smithing and carpentry, while in the rural areas small-scale commercial maize-milling is of some significance. Indeed the Ministry's Comment notes that "the SSI units with some employees [this excludes many of the tailors] in the rural areas are almost exclusively maize mills with in addition a number of carpenters and metal workers".

4.6.4 Modest as these informal and small-scale activities appear, the competition they provide to actual or potential formal activity is in a number of instances quite severe. The vast number of small tailors, though usually working on a self-employed basis without their own premises - often on khondes, or shop verandahs - provide the major outlet for the cotton fabrics produced by David Whitehead's and source of garments for low-income consumers in Malawi. Reference has been made to the competition provided by informal fish processors for the Salima cannery, to MALDECO industrial fisheries by artisanal fishermen, and by village blacksmiths for AGRIMAL in making agricultural implements.

4.6.5 In discussing industrial development, the construction industry is frequently set apart from the more narrowly defined manufacturing sector and, when considered, often thought of in terms of large-scale, modern sector construction. In reality, construction ought to be considered as an industry alongside others, and one which is particularly important to basic needs, this applying to both rural and low-income urban construction. Closely associated with this construction activity, and often integrated with it, is an unusually widespread brickmaking industry.

4.6.6 There were in 1978 some 400 small-scale units producing bricks in Malawi, employing more than 15,000 people (Table 4.6.3). In 1981 these were producing, by the simplest, labour-intensive methods, some 70 million bricks per annum, compared to only about one million machine-made bricks, the latter accounting, therefore, for no more than 1.4 per cent of the combined total. As already mentioned, while the hand-made bricks were of lower quality and durability, they cost only 10 to 20 per cent of the machine-made: a further example of the competitiveness of small-scale enterprise.

4.6.7 The local resource content of SSE activity varies between activities but is usually comparatively high, especially in the case of rural enterprise. This general tendency to use local resources may be associated with the fact that it caters especially for the mass of low-income consumers, providing basic needs such as rural housing, including doors and window-frames made by carpenters, simple furniture, metal containers (here with imported materials), garments, staple food processing, agricultural implements and a variety of repair services which, as already suggested, can be regarded as using local resources. For the same reason SSE activity is also labour-using rather than capital-using, labour being another local resource which is available cheaply. In contrast medium-scale, import-substituting firms will often operate with high import content, exhibit a low proportion of value added, and cater for the higher income groups. Agro-processing, on the other hand, is frequently dominated by medium- or large-scale establishments, often foreign-owned, as in the case of tobacco, tea manufacturing and cotton textiles: thus while small-scale enterprises are often resource-based, resource-based enterprises are not necessarily small.

4.6.8 As indicated above, small-scale enterprises may be both local resource-using and contributive to basic needs provision: and are for these reasons a valuable <u>form</u> of manufacturing. Rural surveys carried out by the Agro-Economic Survey have demonstrated the paucity of ordinary household equipment in the average rural household. In Kawinga, to take an average situation, less than half the households owned a bed, almost the same proportion a chair, and just over a quarter a table (Table 4.6.4), indicating the potential benefit from the development of rural carpentry.

4.6.9 Apart from asking how valuable such activities may be, it is bound to be asked what development potential they have. This involves an examination of the constraints on their expansion, which will be discussed in the next chapter.


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4.7 Overall Prospects for Resource-Based Manufacturing in the 1980's

4.7.1 Having examined the resource base in Malawi, and specific industrial possibilities connected with the separate components of that resource base, we need to bring these together to provide an overall picture of the prospects for resource-based manufacturing in the 1980's, which is done by means of Figure 4.7.1.

4.7.2 While Malawi has been pursuing a deliberate strategy of resource-based industrial development since Independence, as explicitly stated in DEVPOL in 1970-71, with a considerable measure of success, some limits are now apparent. As far as agro-processing is concerned, some additional sugar refining may be expected, although the rapid expansion of estate production of sugar may be approaching a limit, as probably already reached in the case of tobacco and tea. There is scope for some expansion of cotton, which is the crop with easily the most important forward linkages into manufacturing, while some limited rubber output offers some industrial possibilities for the production of rubber sheet and crepe. This will be additional processing of the staples, maize and rice, and development of various minor crops - minor, but each capable of making useful contributions - such as fruit and vegetables, guar beans and macadamia nuts. Population pressure on the land in the Central and Southern Regions presents a problem for continued expansion of industrial crops in the medium term and points to the urgent need to expand the agricultural resource base through development of the Northern Region, where the greatest unused potential exists.

4.7.3 Given the pressure of population on land, the scope for expanded numbers of cattle, particularly beef cattle, is circumscribed, though this would not prevent the development of some second-stage leather-using industries. Dairy production is poorly developed in Malawi, and there is scope for much improvement and extension of the industry. The possibilities for expanding fish production are probably fairly limited. The minerals 'cupboard' appears rather bare, though the sector includes major existing activity in brickmaking and cement production, which together form the basis of the construction industry.

4.7.4 Figure 4.7.1 divides prospective manufacturing activies into first-stage processing and second-stage manufacture, distinguishing

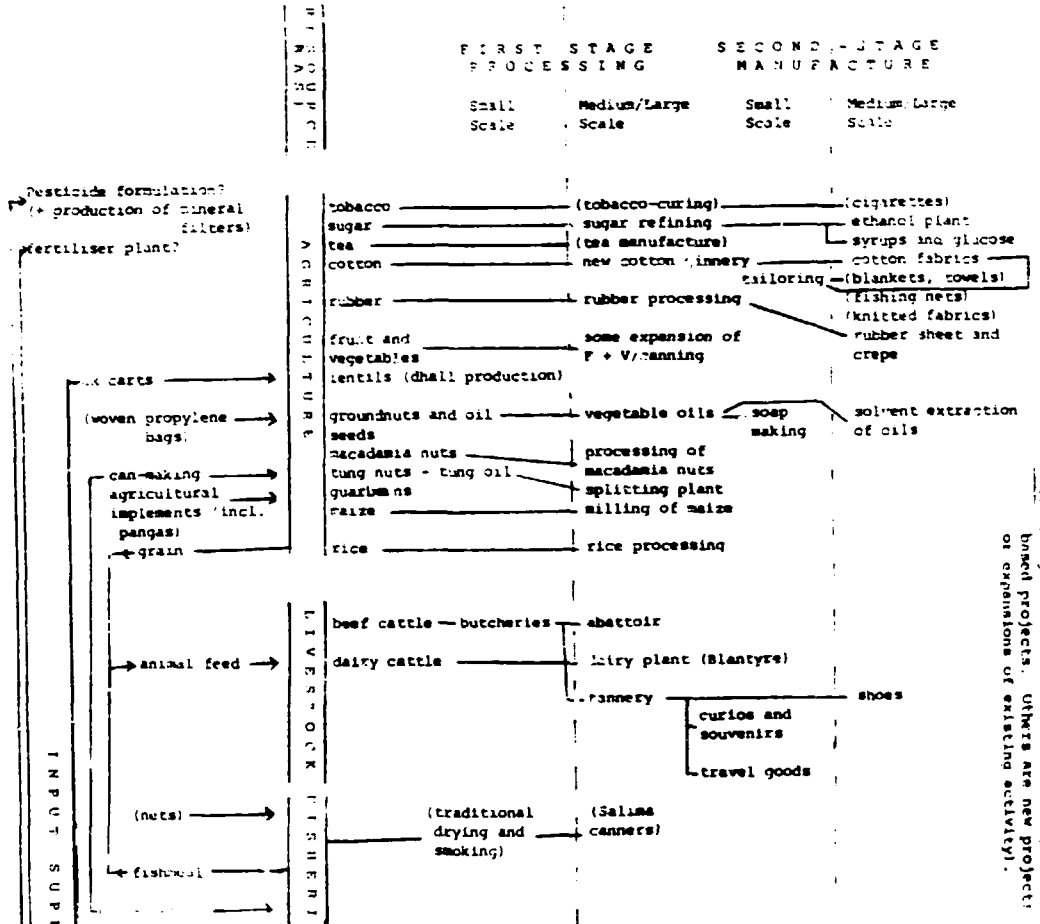
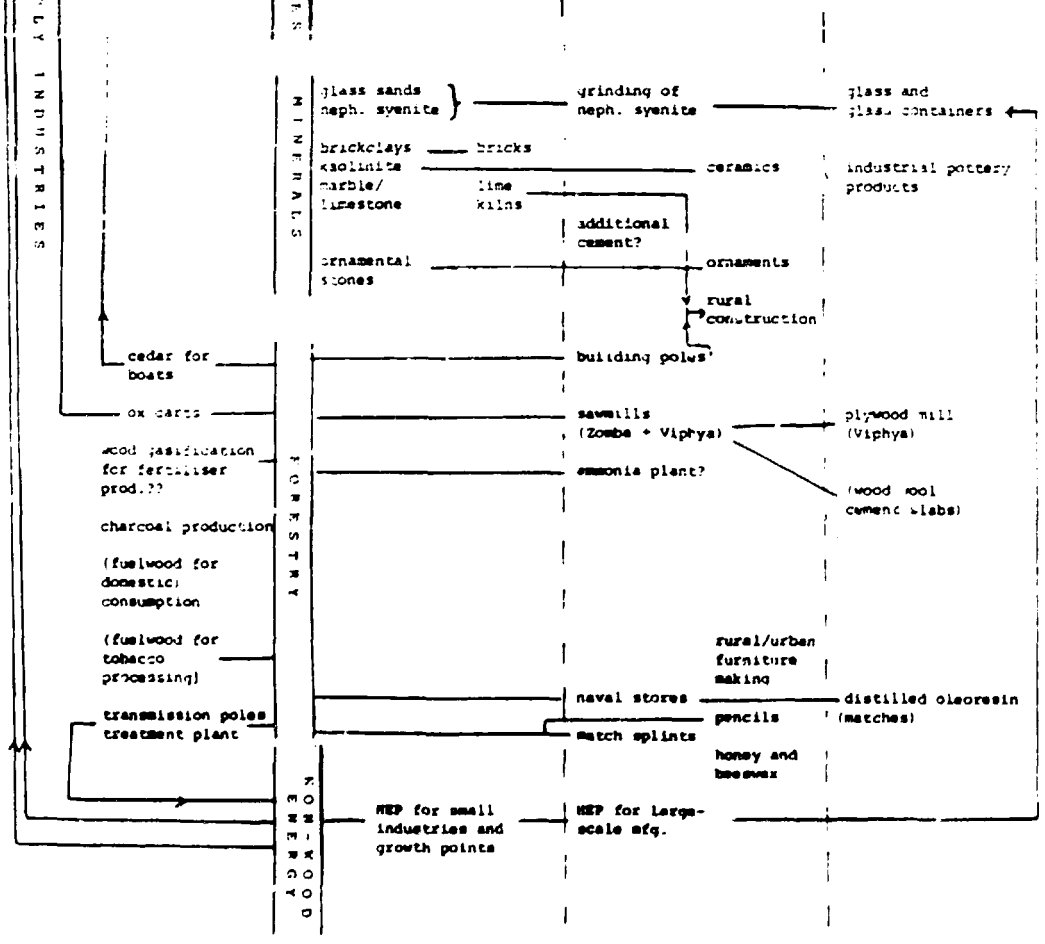


Fig. 4.7.1 Resource-based Industrial Possibilities in Malawi

Note: (Projects in brackets are existing resource-based projects. Others are new projects or expansions of existing activity).


MINERALS
glass sands
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bricks
kaolinite
ceramics
industrial pottery
products
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limestone
lime
kilns
additional
cement?
ornamental
stones
ornaments
rural
construction
FORESTRY
cedar for
boats
building poles
ox carts
sawmills
(Zombe + Viphya)
plywood mill
(Viphya)
wood gasification
for fertiliser
prod.??
ammonia plant?
(wood wool
cement slabs)
charcoal production
(fuelwood for
domestic
consumption
(fuelwood for
tobacco
processing)
rural/urban
furniture
making
naval stores
distilled oleoresin
(matches)
transmission poles
treatment plant
pencils
match splints
honey and
beeswax
GOVERNMENT
MEP for small
industries and
growth points
MEP for large-
scale mfg.

also between activities suitable for small-scale production and those for medium or larger scale production.

4.7.5 First-stage processing which can be anticipated includes some additional sugar refining and cotton ginning, some rubber processing, as well as further maize milling and rice processing. The processing of macadamia nuts and of guar beans has just been mentioned. In the livestock sector the dairy plant and tannery are the main items while, under fisheries, further processing may depend upon the extent of development in fish farming. Under minerals there is potential for further development of small-scale brickmaking, ceramics and lime production, and of ornamental stones, with the possibility, not quite immediate, for expanded cement production. The development of glass sands and grinding of nepheline syenite are significant possible new developments. Some expansion in saw milling is anticipated, together with items such as building poles, naval stores and match splints from the forest sector.

4.7.6 As already stated the major linkages from first-stage processing into second-stage industries have so far been from cotton into the textile industry, particularly the weaving of cotton fabrics but extending into a number of other textile activities, despite the limited base of cotton production which exists. This can be regarded as a rather successful development. Other possibilities appear rather limited, being particularly the ethanol plant, based on sugar production, the manufacture of glass and glass containers, the production of shoes and leather travel goods and curios, and a plywood mill.

4.7.7 Further attention has been paid in Malawi to assessing and developing resource-related industries which provide inputs into the development of the resource base: fertilisers and pesticides remain the most conspicuous gaps, but efforts have been made already to produce agricultural implements, cans and, more recently, woven propylene bags, together with fishing nets and boats for development of the fisheries.

4.7.8 The uncertainty regarding the feasibility of producing fertilisers is associated with the general uncertainty regarding the various related Viphya projects, including the production of pulp. These would clearly have offered a major new stimulus to resource-based manufacturing in Malawi. Unfortunately the scale of forest-

based industrial development is likely to be very much more circumscribed than originally anticipated, for some time ahead, due to economic factors and limitations of present technology.

4.7.9 The uncertain economics of some of the larger projects make it all the more important not to lose sight of the contribution of small-scale and rural industry in Malawi, particularly tailoring, carpentry, staple food and fish processing, brickmaking and rural construction, all of which are resource-based, with scope for considerable expansion if need can be backed by increased purchasing power to convert it to effective demand.

4.7.10 While Malawi does not have a very specific four- or five-year Development Plan document, the Ministry of Trade and Industry has some limited project appraisal capacity and has prepared a loosely-constructed Industrial Development Programme.[1/] Issued in 1982, this follows an even more indicative document providing certain 'Guidelines for an Industrial Development Programme', put together in 1980 with UNIDO Assistance.[2/]

4.7.11 The IDP includes a short list of projects for immediate consideration in 1982, and a much longer list divided into Group I and Group II projects. The main items in the short list (Table 4.7.1) are rehabilitation of the Mulanje fruit and vegetable and Salima fish canneries; expansion of existing textile activities; two tanneries (including a small one in the North); the Vipcor (groundwood) pulp/paper project; a mechanised brickmaking project, lime production, the second cement project, and pottery development; a foundry (using scrap metal and thus local resource-using); and farm implements and tools production. This is consistent with the projects identified earlier in Figure 4.7.1 except for the uncertainty attached to the pulp and fertiliser projects and the timing of the cement project.

4.7.12 The Group I projects (Table 4.7.2) are 'those about which sufficient is known to be potentially viable in the next 10-year

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1/ Industrial Development Programme Guidelines, submitted to the Ministry of Trade, Industry and Tourism by M.A. Oksal and D. Edwards, May 1980.

2/ Industrial Development Programme (Sector Programmes), Ministry of Trade and Industry, assisted by UNDP/UNIDO Team, February, 1982.

planning period'. The list comprises 65 projects of which 55 are considered potentially implementable in the coming five years, though with a possibility of 'slippage' into the next five. Together they are expected to yield some K76 million of value added, of which 27 per cent would come from sugar production and 19 per cent from the fertiliser project. The list does not emphasise the traditional small industries, an omission, but includes some non-resource based small industries such as builder's hardware. About 66 per cent of the projects are considered to be agro-related, and only 25 per cent suitable for small-scale production. About 26 per cent i.e. a quarter of the projects have export potential but only 15 per cent are considered suitable for foreign investment equity participation, being large enough to warrant the effort required on the part of a substantial foreign investor. This leaves considerable opportunity, and need, for domestic Malawian entrepreneurship.

4.7.13 Group II projects (Table 4.7.3) are potential projects which, however, do not appear feasible within the next ten years or which are not yet sufficiently defined. About 50 per cent are considered agro-related and about a third are suitable for foreign investment equity participation. The main need appears to be for feasibility study, since the time-schedule assumed appears over-conservative for those projects which are likely to be viable at all.

4.7.14 It is useful to supplement the various lists of identified potential projects with a check against the detailed commodity imports into Malawi. In Appendix I, rather than measuring possibilities for import substitution merely by value of annual imports for each commodity, as indicating the size of the domestic market involved, the items asterisked indicate items for which Malawi has a possible resource advantage. This gives some indication of possibilities for what one may call <u>resource-based import substitution</u>. Most of the items asterisked appear either in our Figure 4.7.1 or in the Ministry of Trade and Industry's list of Group I and Group II projects, which already substantially overlap.

4.7.15 It would appear from this, and particularly from Figure 4.7.1 that a diligent search has been made in Malawi to find viable resource-based industrial development possibilities, even if the list identified is by no means exhaustive. Much was anticipated from wood-based

industrial development, however, and the reduced scale of expectations here has produced a much more modest programme. In particular these developments would have produced major forward linkages into chemical production and back into the agricultural resource base. As things stand, second-stage manufacturing, going beyond first-stage agro-processing and the equivalent in other sectors, is rather limited, the forward linkages from cotton growing into the textile industry, and tailoring, being the most striking. There is need, therefore, to examine some of the constraints inhibiting further development and possible measures to remove them.

CHAPTER V

CONSTRAINTS ON FUTURE RESOURCE-BASED INDUSTRIAL DEVELOPMENT

5.1 Limits imposed by rural purchasing power

5.1.1 Given the relatively narrow range of second-stage manufacturing industries established so far, there is an obvious need to broaden this manufacturing base. A major constraint here appears to be a lack of purchasing power in the rural areas.

5.1.2 Agro-economic data has been collected over a period of years for a series of districts within Malawi. These data are very crude, but it is possible to derive from them some impressions of rural cash income distribution which suggest that this lack of purchasing power is rather critical.

5.1.3 The income data for different districts has been combined here into one total, not withstanding the fact that they are for different years. Fortunately the spread is limited to a four-year period over which price increases have not been major. Secondly the data relates to cash income rather than total income or output, including non-monetary output. There are a variety of problems of definition and coverage, for instance as between off-farm income and non-farm income, and household income from, for instance, trading activities, and questions relating to the sample selection of households. The 1980-81 national rural income survey will provide much more accurate and comprehensive information. The Agro-economic survey, as just indicated, should not be considered numerically precise and can give no more than an impression of the reality.

5.1.4 The dominant feature of cash income distribution (Table 5.1.1) is the large proportion of households in the rural areas earning very little cash income: over 50 per cent earning less than K20 per annum, and less than 9 per cent of aggregate income. Although this is based on data aggregated from different years, the data for individual districts and years (Table 5.1.2) consistently repeats this pattern. From the point of view of industrial development it is the implied lack of general purchasing power in rural Malawi which appears as a major inhibiting factor.

5.1.5 At the same time, at the upper end of the scale, 11 per cent of households secured nearly half aggregate cash income, and the top

3 per cent obtained nearly a quarter (as much as the bottom 70-75 per cent), implying substantial inequality. This pattern is again repeated for individual districts.

5.1.6 It is useful to ask first, how rural income-earners as a whole obtain their income, and secondly how this richer stratum of 10 per cent obtain their higher incomes.

5.1.7 With respect to rural households as a whole, about 55 per cent of total cash income comes from farming (Table 5.1.3), leaving as much as 45 per cent non-farm income. The major source is income from 'employment', accounting for 22 per cent of the total. Unfortunately it is not made clear whether this is off-farm employment (including employment on other farms and agricultural estates) or strictly 'income from non-farming employment.

5.1.8 Under 6 per cent of income comes from fish, but this is a country-wide average, and since fishing is obviously concentrated in particular areas, households in these areas may depend (again on average) for as much as one-third of their total income (as in Kawinga South) on fish.

5.1.9 About 7 per cent of income, on average comes from cattle and small stock other than poultry, reflecting the lack of development in the livestock sector. Moreover this percentage is much higher in the northern region than in the central and southern regions.

5.1.10 Although tobacco is the most important cash crop, providing 13 per cent of income, this is highly concentrated in four or five districts in the sample. Cotton, one of the potential cash crops earmarked for smallholder development (rather than for estate production) is important in only one district, Ntcheu-Mwanza. After tobacco, maize is the most important crop, accounting for 9 per cent of cash income overall, and making a significant contribution in most districts, followed, perhaps surprisingly, by fruit and vegetables, and groundnuts. To indicate the potential importance of rural non-farm activities, it may be noted that beer-brewing contributes more, overall, than cotton.

5.1.11 Given the localised incidence of many of the cash crops, cotton in Ntcheu-Mwanza, maize in Kawinga-north, rice in Nkhota-kota and tobacco in Dowa-west and Nchisi - and the lack of smallholder

participation in tea and sugarcane (alongside the limited development of livestock production), it is clear that lack of access to cash crops is a major problem for a large proportion of smallholders, and a cause of restricted purchasing power in the rural areas.

5.1.12 Given this general lack of access, it is relevant to look at the chief sources of cash income among the ten per cent or so of high cash income earners (Table 5.1.4). Of those depending particularly on one source about one-third are tobacco growers and one-fifth in paid employment of some kind. Livestock and fish are other sources. More than half are crop farmers and about three-quarters depend principally on either crops, livestock or fish. In saying this, one should express doubts about the sampling frame, and coverage in the sample of non-farm activities such as crafts, trading and other service activities. Differences in income do not appear to be due to differential access to land among smallholders - estate owners apart - since most farms are very small. Specifically (Table 5.1.5), less than 6 per cent are more than 4 hectares and one per cent more than six. Generally high income is associated with access to a cash crop such as tobacco, cotton or rice, a livestock activity or to fishing, if employment is excluded, and it is this access which appears limited, if the data are reliable.

5.1.13 It is worth putting these results on the distribution of income alongside other calculations. A study of income distribution in Malawi calculated that in 1969 the poorest 40 per cent of households received 15 per cent of incomes; the highest 20-percentile received 53 per cent of income; and the richest 5 per cent received 30 per cent of income.[1/] Clearly, with the development of tobacco production since 1969, income distribution is likely to have worsened.

5.1.14 In fact the per capita household distribution of income has been estimated by Kydd and Christiansen for 1977 (Table 5.1.6). Their

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1/ Shail Jain, Size Distribution of Income, World Bank, 1975.

calculations showed the bottom 58 per cent of individuals receiving under 24 per cent of total income, and the top 2 per cent receiving over 32 per cent of total income. This refers to total household income, including subsistence output, which will increase the share of those at the bottom of the scale compared to data covering only cash income. Comparison of Gini coefficients with other countries (Table 5.1.7) suggests that the position in Malawi is relatively unequal although, in contradiction perhaps with the data gleaned from the Agro-economic Surveys. the relatively higher inequality appears to be due to concentration in the top 5 per cent rather than any special position over the bottom 40-percentile.

5.1.15 The effect of low rural incomes on the demand for textile products, for instance, is reflected in the low level of per capita consumption of cotton and man-made fibres of 1.3 kg. per annum, already mentioned (paragraph 4.2.7). This also reduces the scope for rural industries of all types. While the useful contribution made by such industries has already been emphasised, if we compare numbers of rural craftsmen with numbers of population, the numbers are extremely small. Thus in the Lilongwe Land Development Programme area there were in 1978 about a thousand head of population per craftsman, and even more than this in the rural areas (Table 5.1.8).

5.1.16 Where a resource-based industrial development strategy is able to exploit absolute and comparative advantage in specific resources to tap export markets, these problems need not be critical: exports provide the necessary increases in income necessary for cumulative growth. This is more difficult in Malawi's case because of the transport disadvantage it has as a land-locked country, and the limits of its resource base. But, more generally, initiation of cumulative expansion of manufacturing depends in any case on a domestic market as well as overseas markets, even where much of it is resource-based. Thus lack of domestic purchasing power will hamper the development of forward linkages into second-stage medium and large-scale enterprise and the development of small-scale urban and rural enterprise. Malawi needs to consider how it can convert this vicious circle into a 'virtuous'

one,[1/] by taking measures which will increase rural purchasing power and generate opportunities for continuous expansion of manufacturing enterprise, both small and large-scale, thus avoiding the same sort of limitations as conventional import-substitution industrialisation has been found to have.

5.1.17 The prospective position is worsened if one takes into account population increase. Arable land per capita in Malawi has already declined from an estimated 0.86 ha. in 1966 to 0.63 ha. in 1977 (Table 5.1.9) and if the mean of minimum and maximum projections of population recently made by an expert consultant demographer is taken, will have fallen further to a figure of the order of 0.44 ha. by 1985 and 0.26 ha. by the year 2005. Population pressure in Malawi is not equally distributed, however, so that the corresponding declines in the Southern Region would be to 0.33 ha. by 1985, and to only 0.18 ha. by 2005. These are moreover, averages. More recent data on farm sizes (Table 5.1.10) show the mean area cultivated per household to be as low as 1.20 ha. in 1980-1, with a range from 74 per cent above this in Kasungu to 33 per cent below in Blantyre ADD, where the mean area cultivated is just 0.80 ha. Since in 1968-9, when the mean size of farm holding was 1.54 ha., about 29 per cent of holdings lay below 0.8 ha., the proportion of farms cultivating less than 0.8 ha. in 1980-1 might be as high as 40 per cent - again as a national average. The surplus arable land available is estimated to become clearly negative by 1983 in two out of the three regions of Malawi (Table 5.1.9), implying problems arising out of over-use.

5.1.18 Given the need to find land to produce both food and cash crops, and the need to raise rural purchasing power by widening existing access to cash crops, this diminishing land availability inevitably must give rise to concern. This is accentuated by the fact that the main food crop, maize, is very land-intensive so that, as we

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1/ The ILO Mission reports to Colombia and Kenya in the early 1970's identified a 'virtuous circle' where improved income distribution increased demand for low-income products produced by labour-intensive technology, creating more demand for labour and improving income distribution still further, with the same results, continuously. Since such products are also likely to have a high local resource content, this may be associated also with a resource-based development strategy.

saw previously (Table 3.2.2) it absorbs a very large proportion of total cultivable land. This suggests that increasing attention will need to be paid over time to raise maize yields through the promotion of higher-yielding composites and hybrids, in order to release land for other purposes.

5.1.19 It is worth making specific mention of the probably significantly lower cash incomes accruing to female-headed households in Malawi. These accounted for as many as 42 per cent of households in some localities (Table 5.1.11), and for 28 per cent in rural Malawi as a whole. These are likely to have fewer resources of labour and equipment available to them, and be much more restricted to subsistence production of minimum food requirements.

5.1.20 Diminishing availability of land per farm household also raises the possibility of a necessity to import food, imposing an increased burden on the balance of payments, and reducing foreign exchange availability for supporting the development of manufacturing.

5.2 Infrastructure and communications

5.2.1 Given the rather circumscribed situation as far as second-stage industries is concerned, and the limitations of purchasing power, an alternative, or additional, requirement is to widen the resource base: in the absence of major mineral discoveries, the agricultural resource base. The greatest undeveloped potential here lies in the north, which is still severely handicapped by lack of communications outside and inside the area. This stems from the colonial period when the limited infrastructure which was in place was concentrated in the Southern Region, to which the Central and Northern Regions were virtually unconnected by road or any other means. The building of the road to Lilongwe at the start of the 1970's (transport accounted for 29 per cent of planned public sector investment 1971-80 in the Statement of Development Policies, easily the largest item), together with the establishment of the capital there, has produced a major economic impact in the Central Region which it would be desirable now to repeat in the North. While the Northern Region has the greatest amount of arable land still available for development, migration of people is particularly from the North to the Central Region: development in the North should therefore alleviate the growth pressures in Central Region, as well as adding directly to production and incomes.

5.3 Fuel and power

5.3.1 The constraints imposed in the area of fuel and power have already been discussed at some length. While buoyant export earnings have permitted Malawi to survive the worst ravages of increasing petroleum prices on the balance of payments and the macroeconomy, this has carried substantial opportunity costs. And the costs thus imposed have been particularly great in Malawi's case due to its land-locked position within Southern Africa and the fragility of its external communications through neighbouring territories.

5.3.2 The most critical shortages, perhaps have been of fuel wood, made more significant by the huge consumption of the tobacco processing industry, added to mass consumption demand. Alternatives in this area will need to be explored, as well as conservation and development measures.

5.3.3 The major 'plus' here, of direct importance for the development of major new industries, is the considerable potential for hydro-electric power.

5.4 Manpower

5.4.1 A number of observers have identified manpower as a constraint on industrial development in Malawi. Thus the IBRD's report on Agro-Industrial Development states (p. 62) that a 'general lack of indigenous managerial and technical skills is, by almost everyone's admission, becoming an increasing constraint to the industrial development of the country'.

5.4.2 This shortage partly reflects the small stock of educated manpower inherited at Independence. Subsequently the government has attached greater priority to the productive sectors of the economy than to the social sectors. This may be justified on developmental grounds, and has perhaps been justified by the results achieved. However educational expenditure in Malawi is certainly among the lowest in Africa and as a proportion of total government expenditure perhaps the lowest (Table 5.4.1). The adult literacy rate is about 36 per cent and primary school enrolment only about 60 per cent of the relevant age group.[1/] The secondary school enrolment ratio of 4 per cent, for the 14-18 year old age group,[2/] is lower than all but five of 40 sub-Saharan African countries.[3/] Consequently very high social and private returns to investment in upper secondary education appear to obtain, estimated respectively as lying in the ranges 14-21 and 31-50 per cent,[4/] these rates measuring the severity of the shortage.

5.4.3 These shortages are reflected in a high level of vacancies and high employment of expatriates (Table 5.4.2), the highest rates being in higher-level managerial, professional and technical positions. They are also reflected in a high level of dependence on expatriate manpower in these categories, the number of expatriates exceeding 30 per cent in a wide range of occupations. Malawi has been able through its willingness to use imported manpower to maintain a generally good level of managerial efficiency. Nevertheless this dependence means higher costs, as imported manpower is expensive, less than maximum efficiency, because of remaining vacancies and high

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1/ U.N. Conference on the Least Developed Countries, Malawi Country Presentation, 1981.

2/ Ibid.

3/ IBRD, Basic Economic Report, 1982, p. 56.

4/ IBRD, Basic Economic Report, p. xvi.

turnover in filled posts, and a slowing down of programme implementation. The need for specific categories of manpower is therefore measured by the combination of vacancies and expatriate-filled posts. For posts of university-degree equivalent, the proportion of posts accounted for by this combination was, in 1979, 46 per cent (Table 5.4.3). World Bank projections show that these deficiencies will persist throughout the 1980's.[1/]

5.4.4 Affecting all sectors of the economy, but of course particularly the development of manufacturing, and new manufacturing enterprises, is the availability of managers. The 27.6 vacancy rate for managerial posts (Table 5.4.2) is striking. Engineers and accountants are other urgent needs as indicated by a high proportion of vacancies and expatriates in jobs to total posts (Table 5.4.3).

5.4.5 The overall vacancy for farm managers is 26.1 per cent, and that for farm machinery operators, for example, 54.1 per cent, and among agricultural workers as a whole the vacancy rate for the public sector is 23 per cent. These shortages have indirect repercussions on industrial development as they inevitably hamper the development of the natural resource base in Malawi. The shortage of skilled agricultural specialists was considered by the IBRD recently to be one of the 'largest current obstacles' to implementing the Government's rural development programme.[2/] This clearly remains an urgent pri

5.4.6 Delays in responding to emerging shortages now appear likely to produce shortages of engineers and technicians of quite

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1/ IBRD, Analysis of the Manpower 1979 Survey.

2/ IBRD, Basic Economic Report, 1982, p. 56.

critical proportions. Based on a comprehensive Engineering Manpower Survey carried out in 1978 the number of new engineers needed in 1983 may be as high as 502, compared to the anticipated 28 graduates trained in Malawi and 68 returning from abroad, leaving a deficit of some 400 engineers (Table 5.4.4). Corresponding needs for diplomates in 1983 are given as 961 and for technicians 1,891. Needs for the three categories in 1988 are forecast as 910, 1,835 and 3,849 respectively.

5.4.7 In attempting to correct those manpower imbalances, Malawi needs to achieve a cost-effective balance between training at home and training abroad, in order to avoid the development of educational excess capacity. However this balance is achieved, substantial financial resources will be required at a time when rising oil prices and decelerating expansion of exports are reducing Malawi's own capacity to pay. There is a clear need for international assistance here on a multilateral or bilateral basis.

5.5 Entrepreneurship and capital constraints on indigenous medium and small-scale industry

5.5.1 As well as the encouragement of private investment and the growth of an export-oriented industrial base (i.e. resource-based industrial development) the Government's objectives for the industrial sector as given in the Statement of Development Policies included the development of a Malawian entrepreneurial class.

5.5.2 The list of Group I and II manufacturing projects identified by the Ministry of Trade and Industry imply a need for such entrepreneurship: only 15 and 32 per cent of the projects respectively being considered suitable for foreign equity participation on grounds of scale. For this reason it was concluded that 'domestic manufacturers, both public and private; and new Malawian entrepreneurs generally, will have to be the main implementing force in the next ten years for most projects'.[1/] This could be problematic.

5.5.3 The key requirements for initiating manufacturing enterprise may be said to be capital, entrepreneurship and/or technical skills. Apart from the general lack of managerial and technical skills already mentioned, it is stated that 'for local Malawians operating small-scale enterprise, there appears to be little in the way of entrepreneurial efforts applied to manufacturing. Efforts seemed... too much directed towards trading and not enough toward manufacturing'.[2/] It would seem easier, in fact, to indigenize management within large-scale enterprises, despite the major shortage of trained managers and accountants already described. As regards technical skills, also, large concerns are in a better position, given time, to provide their own on-the-job training. From the point of view of both entrepreneurship and technical skills, it is more difficult to train for medium to small enterprises. While these are often dependent upon some technical skill (e.g. in leather goods, soap manufacture or fish canning) or experience accumulated elsewhere, there is no ready mechanism for the transfer of such skills, especially where an industrial activity is new to Malawi. Even in the case of estate production of tobacco, where some local 'demonstration effect' was available, Malawian entrepreneurs from civil service and similar backgrounds found management more difficult than they anticipated.

1/ Ministry of Trade and Industry, Industrial Development Programme (Sector Programmes), February, 1982.

2/ IBRD, Agro-Industrial Development, p. 62.

5.5.4 In this medium range of industrial activity, it is likely that entrepreneurship and technical knowledge are the constraints, as exemplified in the tobacco case, rather than capital, which is more readily available to medium scale enterprise than to small. Much of the indigenous Malawian experience of manufacturing, however, is in very small scale manufacturing, including here that of the self-employed 'craft' entrepreneurs such as tailors, carpenters and brick-makers - where the most important constraint is probably capital. The problem for industrial development in Malawi, therefore, particularly since many of the potential projects which have been identified are in the medium to small range, is one of an 'entrepreneurial gap' between the large foreign and parastatal concern and the very small craft-based informal sector enterprise.

5.5.5 It is important to recognise the existence of two rather distinct categories of manufacturing activity, the small to medium scale enterprise - even here ranging from units employing 5 to 10 workers to small factories employing 30 to 50 - and the large number of craft entrepreneurs, many of whom are self-employed or work with just one or two assistants. Each of these has its own contribution to make to the economy and merits support, support which may appropriately take different forms, given the different constraints and conditions under which each operate.

5.5.6 Many programmes of assistance to small-scale enterprises (SSEs) have included an element of instruction in book-keeping, since very small enterprises seldom keep books. While the ability to keep accounts and to calculate gross margins is clearly valuable, it is doubtful whether this kind of assistance is the most appropriate to small craft enterprises, given the existence of other, overriding constraints on their effectiveness, particularly their shortage of capital and materials. Not surprisingly, in the survey carried out in Malawi in 1978 by a World Bank consultant, in conjunction with the Ministry of Trade, Industry and Tourism, 'it proved.. to be very difficult to convince the African Businessmen Association that any program for the development of African businesses should also include an element of non-financial assistance'.[1/]

1/ M. Arbell, Malawi: Small Scale Enterprise Development, IBRD, September, 1978. Nevertheless in comments on this report the Ministry felt that 'the emphasis should not be on credit but on the development of entrepreneurship and skill'. An 'entrepreneurial gap' is identified here at the medium scale level, but is not the main constraint among SSE's.

5.5.7 The consultant's report considered that SSE's were 'seriously undercapitalised' and 'suffer chronically' from paucity of funds. Generally speaking, they had no access to credit' either for start-up or expansion of their operations', being forced to rely on their own savings and profits. The majority of SSE's advanced finance as the biggest problem and 'only admitted non-financial problems when the team entered into much greater details during the interviews'.

5.5.8 This undercapitalisation was reflected in lack of premises and an inadequate supply of raw materials, both these problems reflecting lack of capital as well as the question of physical availability. The lack of materials and supplies often held up the work of SSE's in Blantyre, and even more in Lilongwe and Mzuzu.

5.5.9 A particularly great need was found in Blantyre for premises, though this was also the position elsewhere, 'most entrepreneurs operating from very small and unsuitable premises', or working under trees or outside their home. This consequence of undercapitalisation of SSE's is common in African countries.[1/] In Malawi most tailors and many other self-employed artisans work on shop verandahs or khondes, in return for rent. This performs the function admirably, and is a mutually beneficial arrangement made possible by the accident of the historical development of shop architecture in Malawi. A Ministry paper estimates that about 95 per cent of self-employed entrepreneurs operate on khondes or in the open air.

5.5.10 Marketing problems or 'problems in finding customers' were also mentioned by SSE's as serious in the IBPD/Ministry survey of 1978. In line with the constraint on industrial development emphasised in the present study, this refers essentially to lack of purchasing power, and indeed the Arbell report states that "The demand for products and services (of SSE's) is predominantly dictated by the purchasing power of prospective customers. These, to a great extent, belong to the economically weak strata of the population' (p. 7). Related problems are competition from larger, Asian-owned businesses with some advantages in terms of scale and capitalisation. Not so important is access to electricity (despite

1/ See I. Livingstone, 'Alternative Approaches to Small Industry Promotion', in M. Fransman, ed., Industry and Accumulation in Africa, Heinemann Educational Books, 1982.

the rural electrification programme), since apparently few SSE's can afford to pay the connection fee.

5.5.11 These findings are borne out in preliminary replies by entrepreneurs in a survey of informal sector enterprises in Blantyre and Zomba, carried out by Mr. B. M. Kaluwa of Chancellor College. These give the three most important constraints as capital, lack of real purchasing power, and the high cost of electricity.

5.5.12 Surveys of the rural informal manufacturing sector reveal similar constraints, except that there is less concentration of purchasing power than in the towns, leaving entrepreneurs with fewer opportunities to accumulate capital, more severe market limitations, and greater difficulties in securing the necessary raw materials.

5.5.13 It is important that policies for the promotion of SSE's be designed to take account of the nature and composition of such enterprises, and the particular constraints and obstacles which they face. Appropriate policies are discussed in the final chapter.

5.6 Project appraisal capacity

5.6.1 The manpower shortages already identified extend, unfortunately, to the economic service of the government. Project appraisal capacity within the Ministry of Trade and Industry is very limited, as reflected in the Group I and Group II lists, which are lists of projects on which some information has been collected, and an opinion expressed, but which have not been systematically appraised within the Ministry. Additional economic expertise is indeed needed for more general assessment of policies and programmes within the Ministry including, for instance, that for small industry development. Apart from being able to assess whether a new project should be proceeded with or not, there is a need for calculations of effective protection rates, not at presented calculated, and other factors affecting the appropriate response to firms requesting special incentives or otherwise favourable treatment or insisting on particular conditions for their participation in joint enterprises with the parastatals.

5.6.2 Within the Office of the President, the Economic Planning Division has the appropriate framework, in the form of a three-fold division between a Macroeconomic Section, an Economic Management Section, and a Project Section, but the last of these is so far not staffed. This may well be the best point at which to inject additional project appraisal capacity.

5.6.3 This is all the more needed because of the limited development of such capacity within the parastatals which, we have seen, are responsible for a substantial proportion of formal sector investment within Malawi. MDC has expanded its own capacity, slowly, over a period of years and is in the best position, together with INDEBANK, which must have some such capacity in its role as a development bank. Press started to develop its own capabilities in this direction only in 1978. ADMARC does not have a project appraisal unit as such, although its development division has some technical expertise which is of value in identifying possible projects within the agro-related area.

CHAPTER VI

POLICIES, STRATEGIES AND MACHINERIES FOR RESOURCE-BASED INDUSTRIAL DEVELOPMENT IN THE 1980's

6.1 Introduction

6.1.1 Malawi since Independence has pursued an effective policy of resource-based industrial development, focussed on the agricultural sector. Both agriculture and manufacturing value added have shown impressive rates of growth, though a deceleration of manufacturing development is evident from 1976. These high rates were, however, based to a significant extent on the expansion of tobacco and then sugar production, both developed largely as estate crops, and on associated agro-processing. If this expansion is to provide a platform for subsequent development of manufacturing activity on a continuous basis, however, it is necessary to look towards the next stage, towards further linked development. For this reason it is arguable, at least, that the emphasis on estates has been wrong from the point of view of long term strategy, even if it proved very effective in generating short term growth.

6.1.2 A conventional import-substituting industrial development strategy was rightly ruled out in Malawi as self-defeating, given its usual orientation towards higher-income consumption goods and the limited size of the domestic market in this regard. The pursuit of the alternative strategy of export-oriented, resource-based strategy has had productive results which do not appear capable, however, of indefinite extension, despite the diligent inventory of resources carried out. An apparent weakness has been the failure to generate the internal purchasing power required to provide the stimulus for continued growth.

6.2 Smallholders versus estates

6.2.1 There are two major ways in which the development of purchasing power might be said to have been retarded: the emphasis on estate production, limiting access by smallholders to cash crops, this perhaps augmented in its effect by the low wages policy pursued; and agricultural pricing policy, which has further reduced the share of agricultural proceeds accruing to smallholders. It may be that while Malawi has successfully avoided any 'urban bias' (to refer to

Lipton's concept)[1/] it has exhibited at least a degree of 'formal sector bias'.

6.2.2 This is not to say that smallholder agriculture has been ignored and, indeed, official policy towards agriculture has been two-pronged; but rather that agricultural policy has had a differential impact on the two sectors. Four integrated agricultural development projects were started after Independence: the Lilongwe Land Development Project (LLDP) in the Central Region, started in 1968/69; the Lakeshore Rural Development Project (LRDP), started in 1968/69; the Shire Valley Agricultural Development Project (SVADP), in the Southern Region, started in 1969/70; and the Karonga Rural Development Project, in the north, started in 1972/73. In 1978 these were merged into a National Rural Development Programme, based on eight Agricultural Development Divisions (ADD's).

6.2.3 Also, associated with these, there has been a relatively effective system of agricultural extension based on a group approach. This has contributed, for instance, to an increase in sales of fertiliser to smallholders, through ADMARC, from 23,000 tons in 1971 to 60,000 tons in 1980. Most impressive has been the repayment rates of 90-99 per cent for short term credit (for seasonal inputs) and of 70-85 per cent for medium term credit.

6.2.4 However the original four agricultural development project areas covered only some 20-25 per cent of the rural population, and it could be argued that the launching of a national programme in 1978 was too long delayed. Moreover there was a heavy infrastructural component which, however necessary, is not the same thing as improved access to high-valued cash crops, access here referring to positive encouragement and direct technical assistance in production in the case of difficult crops such as tobacco. Reference must be made here, of course, to the Kasungu Flue-cured Tobacco Authority, established in 1968, which has a training component; the Smallholder Tea Authority, established even earlier, in 1963; the Smallholder Coffee Authority, operating from 1971 to 1974, and now hopefully to

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1/ Micheal Lipton, Why Poor People Stay Poor, Urban Bias in World Development, Temple Smith, London, 1977.

be revived; and the Smallholder Sugar Authority, initiated at Dwangwa after C.D.C. interest in 1978. All of these are quite localised and limited in their scope so far.

6.2.5 It remains true, therefore, that in practice the main emphasis has been on the estate sector, as far as the development of cash crops is concerned. However the superior performance of the estate sector used by some observers to justify this, as measured by contribution to GDP, to exports or towards manufacturing development through agro-processing, is not in itself proof of the validity of this strategy: (i) it may simply reflect additional effort and resources put into development, and the more restricted access to cash crops offered to smallholders, including government regulation limiting this access; (ii) other disadvantages such as those emanating from price policies may have hindered smallholder development; (iii) estate development may have been in part at the direct expense of the smallholder sector through encroachment on land and demands for labour; (iv) estates may not, in fact, have been as efficient in the use of the resources at their disposal as claimed or implied by some assessments; and (v) the strategy may have some long term disadvantage through its effect on the generation of purchasing power, as already indicated.

6.2.6 We can consider first the substitutability of estates and smallholders in the production of some of the main crops. The quantity of tobacco grown by estates in Malawi, including burley tobacco, increased six and a half times between 1969 and 1979. During this time the share of total hectarage accounted for by smallholders fell from 80 per cent to 59 per cent: the percentage increase in tobacco area under estates was more than five times that for smallholders (Table 6.2.1). The number of tobacco estates increased by 437 per cent over 1970-79, while the number of smallholders growing fire-cured tobacco, the main smallholder variety, increased by just 15 per cent (Table 6.2.2).

6.2.7 While tobacco production by smallholders requires careful supervision and extension, it has proved successful in a number of East African countries, particularly as promoted by B.A.T. Because groundnuts, a major smallholder crop in Malawi, are very efficient

utilisers of residual fertiliser,[1] tobacco can be integrated into a useful smallholder crop rotation.

6.2.8 It would undoubtedly have been possible to develop burley tobacco using smallholders, the tenant system practised by estates - not very efficiently as we shall see - not being very different from this. It has been suggested[2] that the scope for new development in burley production is limited, however, because the world market for burley is very much smaller than flue-cured. It could equally be argued that Malawi should make an effort now to establish itself as substantially as possible in this market.

6.2.9 Sugar has been produced almost entirely by estates, though there is some smallholder production at Dwangwa. In other countries such as Kenya outgrowers' schemes have proved effective and might still be considered here in the future.

6.2.10 Tea has been developed almost entirely as an estate crop in Malawi although again smallholder production, delivering to a central factory, has been effective, again, for example, in Kenya. The limited availability of new tea land precludes much development now.

6.2.11 Interestingly cotton, already grown by smallholders, is only recommended for estate production in the Estate Diversification Study if more realistic official prices were to be fixed, low prices being cited as the reason for the estates' lack of interest in the crop.[3] Rather than using estates as a vehicle for increased cotton production, even under the guise of diversification, it may be better to allocate this to the smallholder mode of production.

6.2.12 The Diversification Study considered the prospects for winter-irrigated wheat on estates to be good, due to the high import parity price. Smallholder production of wheat is, of course, quite possible, however, and given the high costs of irrigation, intensive production by smallholders may be quite advantageous.

1/ See National and Shire Irrigation Study, Estate Diversification Study, Huntings Technical Services, June, 1969, Annexes, p. 13.

2/ E.g. in the Estate Diversification Study, op. cit.

3/ Annex F, p. 5.

6.2.13 Efforts are already being made to expand smallholder coffee production in the north. Minor crops which have been suggested for smallholder development are the oilbearing seeds, sunflower, sesame and soya, as well as cotton, together with guar beans, pulses and cassava.

6.2.13 Livestock production, of both beef and milk cattle, is another activity where costs under smallholders are likely to be lower. Major proportions of milk supplies to Blantyre and Lilongwe are already provided by smallholders, and it seems correct to use livestock as a means of making the kind of contributions to smallholder incomes evident in the Agro-economic surveys.

6.2.14 It would be wrong to underestimate the difficulties of achieving these developments. As stated in the World Bank's Report on Agro-Industrial Development:[1/]

> "Substantial effort is being expended by the Government of Malawi and donor agencies to understand why the output of smallholder agriculture is growing as slowly as it is and what measures might be taken to enhance its performance. No doubt many of the answers are buried in the maze of technical, economic and socio-cultural considerations faced by smallholders in their attempts to maximise income and minimize risk in operating their small landholdings. Flue-cured tobacco production, for example, offers good market prospects for smallholders, but faces several obstacles; limited fuelwood supplies, special husbandry requirements, quality requirements, and world market conditions. These obstacles make it difficult for smallholders to expand their activities rapidly, especially without government assistance. Other crops such as cotton, groundnuts, maize, vegetables and rice offer potential growth opportunities, but these depend on relative returns per person-day between various crops in specific localities, weather patterns, different locations. Pulses also offer opportunities for expansion, but they are higher risk crops than others and their prices have been kept low relative to other crops by ADMARC. Coffee, tea, guar beans, rabbits, leaucaena, sunflowers, poultry and various other production possibilities also exist or are underway that should enable more output from the smallholder. Each of these tends, however, to have fairly limited potential for reasons related to marketing, to location, to state-of-the art of production, etc.."

1/ p.37.

What is needed is to identify suitable economic crop combinations - which should take account of the farmer's primary requirement of first satisfying household food requirements, and supplement this with cash crops - and corresponding technical packages. Given the variations in soil and climate in Malawi, and the probably large numbers of very localised crop combinations suitable, this implies the need for a great deal of agro-economic research, and a national network of sub-stations to take account of local conditions.

6.2.15 Equally, the conventional view of estates as a uniformly efficient mode of production needs substantial qualification. In the Estates Diversification Study it was found that:

(i) A large proportion of estate owerns are absentee owners using hired managers (about 75-80 per cent of estates financed by the National Bank of Malawi in 1980-81, for instance, were in absentee ownership), a situation which differs from that in Zimbabwe;

(ii) development of many estates has been financed entirely through bank loans, with few owners having invested their own capital;

(iii) the majority of owners have only a limited knowledge of tobacco growing;

(iv) standards of management are relatively low, as demonstrated by lack of proper soil conservation and land husbandry practices, and by generally mediocre tobacco yields and quality; and

(v) there has been an 'almost complete absence' of fuelwood planting to safeguard future fuel supplies, as a result of pre-occupation with short-term profit maximisation.

6.2.16 **Different categories of estate are, however, distinguishable: some 200 company estates, run by substantial farming companies; about 75 large individual estates, mostly expatriate-owned; and the smaller individual estates, Malawian-owned, which can be divided into direct production estates based on flue-cured tobacco and the burley estates operated on the tenant system. It is the last two which are the least efficient, although there is substantial variation**

1/ Estates Diversification Study, Chapter 2, p. 14.

within categories.

6.2.17 Lack of effective use of resources by the estates is reflected particularly in the low degree of land utilization. Out of an estimated gross tobacco estate area of some 350,000 hectares in 1979/80 only 9 per cent was under tobacco and perhaps another 5 per cent under maize, giving a total cropped area of 50,000 hectares only.[1/] Even allowing for fallow, it is clear that no more than 40 per cent of the available land was in productive use at all: this in areas of critical land shortage in the smallholder sector.

6.2.18 Out of 639 burley tobacco estates in 1979/80, 367 were tenant-estates, embracing 18,722 tenants, each with one or two acres of tobacco and, usually, some maize land. The estates supply supervision and inputs, at a charge, while requiring the tenant to sell his tobacco through the estate at ceiling prices usually well short of auction prices. Since the supervision offered, particularly with absentee owners, is usually minimal, the advantage of this system over straightforward smallholder organization is questionable.

6.2.19 There is direct competition for land and labour between the estate and smallholder sectors. The estates are mostly on leased customary land, covering some 470,000 hectares in 1981 or nearly 15 per cent of 'the best cultivable land'[2/] - including as much as 17.4 per cent in the Central Region. This expansion of acreage under estates is comparatively recent, the numbers having expanded from 220 in 1970, then occupying about 2 per cent of the cultivable land, to over 1,100 (predominantly tobacco estates) by 1978, occupying an estimated 13 per cent of the cultivable land then available.[3/] The effect on smallholder farming of the transfer of some 140,000 people into wage employment is not easy to assess, but could also have been significant. The near lack of fuelwood planting by the estates until recently also implies a major divergence between private and social benefit, as described already.

1/ Estates Diversification Study, p. 13.

2/ IBRD, National Rural Development Programme Review, 1980, p. 1.

3/ IBRD, Malawi: Employment Aspects of Economic Development, Report No. 3463-MAI, p. 44. The method of calculating cultivable land may not be exactly the same here.

6.2.20 The Estate Diversification Study made detailed recommendations for improved land utilization and diversification of activities on the estates, which need not be reviewed here. Alternative use of the land was outside the Study terms of reference. The recommendation for a 'slimmed down', more efficient estate sector is to be supported, with diversification where suitable additional activities exist. In assessing diversification, however, and the best way of taking up slack land, the possibility that this land could be more intensively used through smallholder production, and that the additional activities might be more suitable for small-scale rather than large-scale farming, should be considered.

6.3 Wages policy

6.3.1 As noted at the outset of this review, Malawi's low wage policy has been viewed as an important positive factor in creating employment opportunities and in restricting the rural-urban migration so problematic in other developing countries.

6.3.2 Certainly IBRD calculations for a range of estate crops in Malawi show a high degree of sensitivity to wage changes in the rate of return on shareholders' equity.[1/] The main estate crops, tobacco, sugar and tea are all highly labour-intensive so that wages account for a significant proportion of direct cost.

6.3.3 However with respect to the choice of technique in manufacturing and in the economy as a whole, our previous analysis of employment elasticities produced less than conclusive results. And, independently of any effect on choice of technique, a large proportion of the increase in employment has been in estate agriculture. Thus 77 per cent of the increase in formal sector employment over the period 1968-77 was in agriculture, forestry and fishing - mostly estate agriculture. About 64 per cent of the increase in private sector employment over the period 1971-79 was in the same sector.[2/] This expansion in estate employment is not necessarily a genuine net increase in employment, since it could be considered in part a diversion from the alternative of smallholder production, which is equally or more labour-intensive.

1/ IBRD, Malawi: The Development of the Agricultural Sector, Report No. 3459-MAI, May, 1981.

2/ NSO, Statistical Yearbook, 1981. The estimate takes account of the break in the employment series in 1977.

6.3.4 Finally, there is the question of the impact of the policy on rural purchasing power, given this alternative and the severity of the wages policy applied. The Basic Economic Report states[1] that average real earnings of labour fell by about a third over the period 1969-79 and Malawi's Country Presentation in 1981 gives the fall in average real wages since 1970 as 34 per cent.[2] This came about through imposed rigidity in money wages, the minimum wage for urban unskilled workers remaining unchanged from 1973 to 1980, going up by 12½ per cent in 1980, and a further 56 per cent in January, 1981. Since the real wage minimum was then only 75 per cent of the 1973 level,[3] the real rate just before the two increases would have been just 60 per cent of the 1973 level, implying a 40 per cent in real wages over seven years up to the time of increase.

6.3.5 These considerations suggest that, still within the context of a realistic wages policy, a more flexible approach would have been possible and desirable, and one avoiding sudden spurts in the wage rate.

6.4 Agricultural price policy

6.4.1 Perhaps even greater in its impact on rural purchasing power has been agricultural price policy. Kydd and Christiansen have argued that the financial resources used in the development of the estate sector were obtained by in effect imposing a heavy tax on smallholders via ADMARC deductions, this 'onerous tax burden' operating to reduce the real rate of return to peasant labour sufficiently to induce a substantial transfer of labour between the sectors, despite the continuous decline just observed in the real wage paid to estate labour.[4]

6.4.2 The tax is imposed through excessive margins between ADMARC selling prices and prices paid to producers, and is thus reflected in ADMARC profits on the various crops (Table 6.4.1).

1/ IBRD, Basic Economic Report, p. xiii.

2/ U.N. Conference on the Least Developed Countries, Malawi Country Presentation, ODC, 1981, p. 15.

3/ As stated in the Report and Recommendations of the President of the IBRD to the Executive Directors on a Structural Adjustment Loan to the Republic of Malawi, April 28, 1981.

4/ J. Kydd and R. Christiansen, 'Structural Change in Malawi since Independence: Consequences of a Development Strategy based on Large-scale Agriculture', World Development, 1982.

These amounted to an average annual figure of profit on all crops (measured in 1980 prices) of over K17 million over the period 1971/2 to 1979/80, 80 per cent of this from tobacco. Over the years 1972-78, ADMARC profits varied between 22 and 39 per cent of sales.[1/]

6.4.3 Comparing moving averages of prices paid and received for dark fired tobacco, for example, the proportion paid to growers can be seen to fall from as high as 60 per cent in 1957 to just over 21 per cent in 1975, being below one-third for most of the 1970's (Table 6.4.2). A major advantage of the estates has been that they have been free to sell direct at auctions.

6.4.4 Smallholder cotton is another crop which appears to have been adversely affected. The area under cotton is said to have been diminishing in recent years as a direct effect of pricing policy, with yields also falling. The decline in yields of over fifty per cent, in the Southern Region particularly, is associated with a lack of incentives which has affected interest in spraying.

6.4.5 In addition the composition of agricultural output is affected by the relative prices fixed for different crops, given the high degree of substitutability between, for instance, cotton, maize and groundnuts, and by irregular, large jumps in individual prices. As an example of the latter, a 50 per cent increase in the price of groundnuts in 1979/80 had the effect of more than doubling output, with a further increase in 1980/1. Similar increases in maize prices have met an equally strong response. While this sign of greater flexibility in pricing is to be welcomed, it raises the question of why previous prices were kept so low and whether the drastically changed ratio of prices is now appropriate.

6.4.6 Prices of major crops have frequently been out of line with export parity, and the relation of producer prices to export parity, has differed greatly between crops. For instance, in 1977 the ADMARC

1/ Derived from ADMARC Annual Reports

purchase price for groundnuts in Lilongwe was 10 t/lb., compared to an export parity price at local markets of 24.4 t/lb., an implicit tax of 144 per cent. The corresponding prices for maize in Lilongwe were 2.3 and 1.4 t/lb., representing an implicit subsidy in this case of 39 per cent.[1/] In addition substantial geographic variations in the extent of these implicit taxes and subsidies have arisen out of the policy of nationally uniform buying prices. Prices of minor crops such as lentils and guar beans also show this sort of divergence and require scrutiny.

6.5 Price control

6.5.1 The government operates a system of price control combining maximum retail prices for a limited range of essential products, either low-income consumer items such as meat, milk, sugar, beer, matches, bread, maize meal and vegetable oils or basic inputs like petrol, hoes and fertilisers, and 'recommended' retail prices covering most other locally manufactured products which, though generally observed, are not legally binding. For these products there is also a requirement that the Ministry of Trade and Industry be notified in advance of proposed price increases, which must be justified in terms of increased costs of some kind before a letter of 'no objection' is issued.

6.5.2 There is some divergence of opinion on the effectiveness and impact of this system. A UNDP/UNIDO Programming Mission describes it as a 'rather flexible policy... complementary to the Government's policy limiting wage increases to productivity increases' which 'does not... appear to have represented an undue burden on industrialists'.[2/] On the other hand, the World Bank's Basic Economic Report saw it as having a negative impact on the profitability of business firms, constituting a significant disincentive to investment in the sector, as a result of long delays in granting price increase requests.

1/ IBRD, Basic Economic Report, p. 92.

2/ Report of UNIDO Programming Mission to 3rd Country Programme Cycle 1982-1986, UNIDO, Vienna, November, 1981.

6.5.3 Certainly the system is not popular with manufacturers, as is to be expected of any price control, but it must also be seen in the context of a wages policy. On the other hand there are a number of products, particularly in the agricultural sector, such as meat and milk, where serious divergences have occurred or are occurring, with various repercussions. These cases appear to be those in which the relevant ministries (in the case of agricultural products the Ministry of Agriculture advises the Ministry of Trade and Industry) lack relevant researched data on which to base sensible decisions. Here it is clearly better to minimize intervention. To deal with the problem of delays in expressing a lack of objection, it would be desirable to introduce a maximum period of, say, one month, for a decision to be made.

6.6 Other measures and incentives

6.6.1 We can consider very briefly what other aspects of government policy have direct or indirect effects on the pursuit of a successful industrial development strategy, or whether any specific new measures might assist it.

6.6.2 The well-established policy to offer strictly limited levels of tariff protection to domestic industry appears to have had healthy results. At present information is not available on effective rates of protection, something which ought to be investigated. Resource-based industries catering for the domestic market enjoy a degree of natural protection, so that strong measures to encourage the use of domestic resources are not necessary, except indirectly in promoting local small industries, many of which are local resource--using. The present system of customs rebates and drawbacks on imported inputs used in manufacturing involve some bias in favour of production using certain imported inputs, however, and might be examined.

The import list (Appendix 1) suggests that there are a number of consumer goods which could be substituted by locally-made products which may be of rougher quality than the imported equivalent but in many ways more 'appropriate' at the present time.

6.6.3 The constraints on an export-oriented industrial strategy, even in respect of exports to neighbouring countries, suggests that Malawi ought to look to its other potential advantage, cheap labour, and combine this where possible with a resource advantage. To exploit a labour advantage and offset other disadvantages such as transport costs for inputs and outputs arising out of a land-locked situation will require the development of labour skills. Malawi is at a disadvantage here compared to, for instance, Zimbabwe, because of the much more limited size of its industrial 'training ground', and the best way in which incentives could be offered to persuade firms to expand their training programmes should be considered.

6.6.4 Malawi was wise to introduce a ten per cent duty on imported raw materials and capital goods in the mid-1970's, together with a three per cent levy. This reduces the incentive to go for capital-intensive techniques of production, at the expense of employment.

6.6.5 One weakness in the system is that these duties can be waived on the basis of individual application if a special case is made: this opens up the possibility of large foreign or domestic investors bringing pressure to bear to secure preferential treatment, and more generally opens the door to possible corruption. This flexibility should be removed.

6.6.6 The impact of the limited duty on capital good imports on the choice of technique is, unfortunately, likely to be cancelled out by the standard set of allowances which exist in relation to capital investment. These include initial allowances (20 per cent on plant and equipment) annual allowances (variable, but going up to 33 per cent on plant and equipment), investment allowances (10 per cent on new plant and equipment other than motor vehicles) and initial expenditures (incurred prior to start-up). It would appear desirable to review the whole system of fiscal incentives as it impinges on the choice between capital and labour, and particularly on the development and use of labour skills.

6.6.7 Much of Malawi's exports of 'manufacturing' have been in the form of value added by agro-processing of commodities like tobacco or tea which need only limited promotion on the world market. The development and exploitation of less well-known agricultural commodities or minerals, such as guar beans, macadamia nuts, Malawian honey, or ornamental stones may need more deliberate export promotion or export

incentives, as would new 'second-stage' industries exporting consumer goods. The IBRD reports that the Import and Export Company of Malawi (IMEXCO), the MDC subsidiary involved in trading domestic and imported products, had only one person working on exports in 1979, while an Export Promotion Council, established in 1971, has only limited budget and staff,[1/] which should be expanded.

6.6.8 As regards fiscal incentives, a direct subsidy related to the domestic value added in export production could be considered. This would have the advantage over some of the capital allowances described, of not favouring capital-intensive activity.

6.7 Policies towards local small industry

6.7.1 The actual and potential contribution of small industry to industrial development in Malawi has already been emphasised. Finance to this sector is largely unavailable from the commercial banking system where the two banks follow conventional conservative policies requiring a high degree of collateral or 'good standing'. The normal minimum loan extended by INDEBANK is K100,000 and although INDEBANK did establish a Special Development Fund in 1981 to cater for smaller enterprises, it still applies a lower limit of K25,000. A small Government Loans Board has made loans mostly to the agricultural sector.

6.7.2 The government asserted a basic commitment to assist small enterprise development when it established SEDOM, the Small Enterprise Development Organization of Malawi, in 1980/81. This remains largely externally financed and expatriate-run, so that the Goverment itself still has to make a significant commitment in terms of finance or manpower to small enterprise promotion either within SEDOM or within the Ministry. The best approach for SEDOM to pursue within a general programme for the development of small industry has still to be determined.

6.7.3 In deciding appropriate forms of assistance it is necessary to make an essential distinction between small factory industry, or other enterprises of equivalent size, and very small informal sector enterprise comprising mostly self-employed craft entrepreneurs or enterprises employing three or four people.

1/ Basic Economic Report, p. 127.

6.7.4 The best way of assisting very small craft enterprises such as carpenters or tinsmiths follows from an examination of the constraints facing them. As already indicated, the vast majority of self-employed entrepreneurs lack premises and are short of tools and materials with which to ply their trade, reflecting their undercapitalisation. Since cash loans to this type of entrepreneur are both risky and difficult to administer, the easiest way of injecting capital into such enterprises would be through establishing simple workshop clusters. These can serve as focal points for the delivery of materials and technical assistance if required, and attract buyers. Recommendations along these lines have been made in the Arbell Report on Malawi and for a number of other African countries by the author.[1/]

6.7.5 Malawi's very limited experience in this direction has not been very good so far, but because of the manner of its application rather than the validity of the approach itself. The Biwi Triangle in Lilongwe, which was opened in 1977, has made the common mistake of offering much grander workshops than appropriate for most of the very simple informal enterprises which need assistance. As a result, the economic rents, ranging from K60 to K110 per month are far in excess of what most SSE's can afford to pay. Consequently a large number of sheds stand empty, though this is also the result of the poor choice of location, inconveniently far from shoppers: as evidenced by the intensive artisan activity which goes on in Lilongwe in the vicinity of the major market. A false analogy appears to be drawn here with the concept of an 'industrial area' which supplies only wholesalers and can afford to be away from the market centre. The planning of workshop clusters should clearly take account of the need of many artisans to sell direct to consumers. The motor repair section at Biwi, comprising ten units (of which only three are occupied) and a limited common facility are not very appropriately designed. No additional equipment is provided, welding equipment, for instance, which might allow an undercapitalised mechanic to compete for business with the larger garages. The entrepreneurs are thus provided with overelaborate buildings, with little useful content. Prior discussion with the entrepreneurs themselves could have identified their most critical needs. The other two sections are an irrational mixture of activities, including a butcher's shop, unhygienically located opposite a craft worker's, a laundry (far from

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1/ I. Livingstone, 'Alternative Approaches to Small Industry Production', in M. Fransman, ed., op.cit.

consumers), tailoring, battery reconditioning, knitwear, motor bicycle repair, and radio repair. The high rents clearly keep out the mass of independent artisan/entrepreneurs in Lilongwe, who remain without premises, while catering for a small, heterogeneous and randomly selected group.

6.7.6 The Liwonde estate, dating from 1975, was even more inappropriately designed, with a luxurious steel-made structure, costing altogether K675,000 and built before it was known what nature of activities it might house. The estate was again remote from the major urban centres like Blantyre and Lilongwe, and even from Liwonde itself. It totally misread the locational pull of isolated premises in Liwonde compared to that of an urban/industrial complex such as Blantyre. It would be unfortunate if this example were to prejudice thinking against an industrial estate approach of a quite different type, that of very simple workshop clusters. The rental of K5 per month suggested in the Arbell report indicates what is required.

6.7.7 An immediate issue is how SEDOM should divide its attention between rural and urban activity, and between promoting craft entrepreneurs and much more varied 'industrial' SSE's producing a variety of small industrial products. Its own inclination is to concentrate on the latter, focussing for the first three years in Blantyre before turning to a second major urban centre like Lilongwe. In fact both types of activity are in equal need of assistance, and it would be desirable to make progress in both directions at the same time.

6.7.8 It should be noted that much the same assortment of self-employed craft entrepreneurs exist in the urban areas as exist in the rural areas. Within this category the rural-based entrepreneurs are more difficult to assist, being more dispersed and frequently under-employed, seasonally at least, as a result of limited village demand. Supply of materials to dispersed artisans of this type, in the manner in which the Salima Trade School, for instance, has attempted to assist its village-based graduates, is unlikely to be economic.[1/] How best to assist village artisan activities needs more investigation.

1/ Attempts at this kind of service, together with the supply of extension advice, proved extremely expensive in Kenya in the mid-1970's, largely because of transport costs, and were quickly abandoned.

6.7.9 The rural/urban issue arises again in considering the appropriate form of assistance to larger SSE's. Many of these are located in rural areas and are resource-based, sawmills, for instance, smaller agro-processing units, and rural construction companies. It would be unfortunate if these were ignored as a result of adopting a narrower focus. The main need here is likely to be finance. Once SEDOM has established a presence through small industrial estates in the main regional centres, administration of these estates can usefully be combined with the management of credit assistance to larger rural-based enterprises in the locality.

CHAPTER VII

SUMMARY AND CONCLUSIONS

7.1 Malawi has deliberately eschewed the conventional import-substituting industrialization strategy, recognizing early on the difficulties associated with a small domestic market, and adopted, from Independence, an export-oriented, resource-based industrial development policy. It has, moreover, been singled out, as exhibiting an exceptionally successful rate and pattern (among other things a labour-intensive one) of industrial development which might serve as a model for others to follow. Its experience is therefore particularly deserving of scrutiny and evaluation.

7.2 This review has attempted to assess Malawi's success with this strategy up to the present as well as to examine the prospects for the future for specific resource-based industries and for industry as a whole.

7.3 An impressive rate of growth in the value of agricultural output and of manufacturing value added has clearly been achieved. Revised statistics of manufacturing value added, however, show clear evidence of stagnation from 1976 onwards - the extent of which will become clear when figures up to 1982 are available - and we should therefore be much more cautious in assessing manufacturing development in Malawi than some of the recent reports.

7.4 Related to this is the fact that the higher rates of growth of manufacturing value added have depended rather heavily - though certainly not exclusively - on agro-processing of the main estate crops, tobacco, tea and sugar. It cannot be expected that the same rate of expansion of cash crop agriculture can be expected in the 1980s as in the 1970s, which experienced an unprecedented boom in estate production. In particular expansion of tobacco production is likely to run into a serious fuelwood constraint, and past over-investment will require continued restructuring of the tobacco estate sector.

7.5 It follows that it is not possible to extrapolate past rates of growth of agricultural expansion or of related industrial expansion. The way ahead in agriculture must be re-assessed and a wider range of separate contributions considered. In industry the way ahead needs similar re-assessment in the light of less direct agricultural expansion, disappointment in respect of some major resource-based industrial developments, particularly those based on wood, previously expected to give further major impetus to industrial growth, and unfavourable external factors impacting upon the economy.

7.6 It is relevant to consider here both measures to develop and widen the resource base upon which industrial development can depend and measures directly related to manufacturing industry.

7.7 It cannot be expected here that the same rate of expansion of cash crop agriculture can be expected in the 1980s as in the 1970s, which experienced an unprecedented boom in estate production. Further expansion of sugar production can be expected, leading to more sugar refining and an ethanol plant, which could be of some importance. Cotton should also expand, with promotional effort, and some rubber production could provide the basis for manufacture of rubber sheet and crepe. Fruit and vegetable canning offers some possibilities, as do minor crops such as macadamia nuts and guar beans. Expansion of tobacco production is likely to run into a serious fuelwood constraint.

7.8 Cotton, though not the most important crop in Malawi, has proved to have the greatest forward linkages into manufacturing. Malawi's textile and garment industry being the most important second-stage industry so far developed. Though scope for expansion of cotton cultivation is limited in Malawi maximum attention should be paid towards its encouragement within the limits which exist. Further expansion of sugar production can be expected, leading to more sugar refining, the building of an ethanol plant being a particularly promising project. Some rubber production is anticipated which could provide the basis for manufacture of rubber sheet and crepe. Fruit and vegetable canning offers definite possibilities, as demonstrated by buoyant smallholder supply, if certain problems can be resolved, including the

supply of cans. If cans have to be imported this must cancel out any export advantage deriving from resource-based activity of this type. Opportunities exist for the development of several minor crops such as macadamia nuts and guar beans.

7.9 To provide continued momentum, it is essential to widen the agricultural resource base by developing the nothern region, where most of the remaining unutilized cultivable land exists. It is against Malawi's long run interests given the high rate of population growth to have a situation where current patterns of migration are away from the region where most of the unused land exists towards the central and southern regions where the prospects are of quite rapidly diminishing average sizes of smallholder farm plots. This requires further infrastructural investment as a matter of priority, and a major expansion of extension efforts in the north geared to specific crop possibilities.

7.10 Pressure of population precludes extensive cattle raising, or ought to, and hampers even intensive beef and dairy production, so that Malawi is less well placed than many African countries for developing livestock-related industry.

7.11 Nevertheless there are good prospects for a tannery - though existing projections of the supply of hides and skins need to be modified - leading to the production of leather shoes and travel goods. Leather-working industry can be developed on a relatively small scale, using labour-intensive craft skills which can also be developed, and does not require an infinite supply of hides. However, improvements in the existing arrangements for the collection of hides and skins, and changes in existing price structures to improve incentives to deliver hides, are essential.

7.12 Expansion in the supply of meat and milk, not only for urban consumers, but also for consumers throughout the small areas, is vital to basic needs and welfare, particularly in areas less well supplied with fish. Considerable unsatisfied demand for milk is apparent in both urban and rural sectors. Cattle are still raised by relatively few people, and there is need for more aggressive efforts to develop smallholder production of milk throughout the country, including production for self-consumption and sale to neighbouring rural households. Apart from

developing the resource base in this way, there is a problem of low price incentives to producers, which needs to be corrected. At the moment efforts appear to be directed more towards encouragement of intensive beef-raising rather than dairy production, and it should be investigated whether this is really the right balance.

7.13 Malawi's fisheries are an important resource, and already make a major contribution to the national economy as a source of food, compensating for deficiencies in the availability of meat. The Malawi Government has been correct in placing the main emphasis on artisanal fishing and ensuring a comparatively good supply of nets for use by the fishermen through a domestic supply industry. The scope for expansion of the total catch, however, and for exports, appears rather circumscribed, though fish farming has potential which needs to be pursued.

7.14 Effective fish supplies could, on the other hand, be substantially increased through the improvement of fish processing and marketing through the provision of additional icing points and fish preservation centres and through an expanded credit programme for fishermen, processors and traders. The emphasis here should be on improved availability of fish to the mass of low-income rural and urban consumers. Assistance to fishermen in the acquisition of boats, and to boat-builders is required. Priority access by boat-builders to the limited supplies of mulanje cedar available could be considered, on grounds of use in producing capital goods (boats) in preference to consumer uses.

7.15 Though the Salima fish cannery is small, its fate is important to the future of the industry and the development of any future canning capacity. There are some dangers associated with MDC participation. MDC should be aware of the difficulties which have been experienced and will remain, and of the need to maintain a low-cost, labour-intensive operation.

7.16 Forestry thinking in Malawi has been dominated, until very recently, by the vast Viphya resource, into which most investment of resources has gone since Independence. It has turned out, unfortunately, that the main anticipated use, the production of pulp for export, is not economic while the remote location of the forests and the fact that they are composed largely of softwoods, limit their usefulness. The paradox is that there

has simultaneously arisen a serious, indeed critical problem, which was not anticipated, of fuelwood availability, requiring wood of a different type, in the central and southern regions, affecting the key tobacco export industry in a major way and, even more important, affecting the mass of rural and urban consumers througout the country. While it is sensible to continue to consider how the Viphya resource might best still be used, it is important to give priority to the much clearer demands for wood supplies for fuelwood and traditional construction, where a huge deficit is apparent, affecting the basic needs of Malawians as a whole. This type of wood is also used, moreover, as fuel for rural activities such as fish processing, brickmaking and lime manufacture and for activities such as small-scale furniture making.

7.17 To deal with the fuelwood crisis there should be a combination of approaches including household agro-forestry, village woodlots, additional fuelwood plantations established within reach of rural consuming populations, and new measures controlling access and encouraging self-supply by large users. Reliance on household agro-forestry by itself is not likely to be sufficient or capable of producing results as fast as they are needed. A plan for maintaining or ameliorating the situation in the central and southern regions needs to be drawn up quickly into which new research results can be incorporated as they became available.

7.18 While large-scale pulp production for exports is ruled out, a smaller scale plant for the home market using grinding methods may be feasible. Other major means of using the Viphya resource would be the production of ammonium sulphate for use in producing nitrogenous fertilizers, at present imported on a large scale, and wood gasification for the production of petrol. Whether an ammonia plant would be economic still needs to be substantiated, however, and it does not appear that the technology for petrol production using wood gasification has been developed to the point where it is capable of commercial application.

7.19 Softwood and hardwood lumber supplies elsewhere in the country areimportant, on the other hand, already offering linkages into the construction industry, both large-scale and small-scale, with sawmilling,

building poles and plywood manufacture. Assistance to rural and urban carpentry through a raw materials scheme should be considered and there is some scope for developing the production of ox-carts from the base which already exists. Large-scale production of charcoal is probably not the best way to proceed, but how best to assist the development of small-scale charcoal production needs investigation. There is scope for developing traditional production of beeswax and honey.

7.20 The potential for mineral-based industries in Malawi is obviously limited in the absence of any major natural deposit. The cement factory is the largest single project at the moment, but in fact traditional brickmaking is a major industry in Malawi. Lack of counterpart provision has prevented Malawi from taking the fullest advantage of the presence of a UNIDO assistance project covering the period 1978-82, but there is need for follow-up, perhaps through direct assistance to the industry through the agency of SEDOM or the RGC's and technical assistance in identifying suitable clays and in land apportionment. A glass factory is the most interesting second-stage mineral-based industry which appears feasible.

7.21 In addition to export-oriented industry scrutiny of the import list suggests that there is room for some further 'resource-based import substitution' which combines production for the domestic market with local resource usage. In a number of cases it would appear possible to substitute a local 'appropriate' product for a more finished but not essential imported product. These possibilities need closer investigation.

7.22 While there is an 'energy crisis' in Malawi in terms of fuelwood supply, this supply cannot be directly substituted by hydro-power. HEP does, however, constitute the main energy source for formal sector industry and Malawi is fortunate in having considerable potential here.

7.23 Rural electricity supply is not likely to be economic in the foreseeable future, but since access has been provided to a number of rural centres along a north-south axis right through Malawi, planning of small industry developments, e.g., through the RGC's, should take account of this. This does not appear to be the case at present.

7.24 Planning of electricity supply capacity by ESCOM is severely affected by major indivisibilities on the demand side. The 'lumpiness' of projected demand makes ESCOM plans for the future highly vulnerable and indeed most of its projected demand is not likely to materialize. This has implications for the costing of electricity, and the allocation of costs to projects, which need consideration.

7.25 On the side of energy, the possibilities of drying tobacco with solar energy should be especially closely monitored.

7.26 A review of the present and prospective picture of resource-based industrial possibilities, summarized schematically in Fig. 4.7.1, shows still rather limited second-stage industry. The most important linkages into second-stage industry which have been developed are in the textile industry, directed towards the domestic market, where large-scale production of cotton fabrics has combined effectively with extensive small-scale tailoring activitiy. As indicated above, the other area where major forward linkages were anticipated - as far back as DEVPOL in 1970/71 - was the forest sector, based on the massive Viphya forest resource, leading into a large pulp and paper project and into chemicals. The substantial scaling down of expectations in this area has clearly left a big hole in the prospective range of second-stage activity which can be expected in the immediate future. Thus despite the high rates of growth of manufacturing value added it remains to be seen whether the strategy of resource-based industrial development pursued, particularly given the limitations of general purchasing power to be discussed, can produce the impetus by itself to generate a widening range of second-stage industries.

7.27 Not many backward linkages from the agricultural sector have been developed so far, though the production of woven propylene bags is a major example. Fertilizer production (as opposed to formulation) would be the most significant one but depends on the feasibility of chemical production as already discussed. The scope for the production of agricultural machinery is limited by the small proportion of farmers who use ploughs. The firm producing hoes is in some economic difficulty due to the potential competition of imports and actual competition from the informal sector. The diversification of production to include cutlasses is appropriate to the situation in Malawi.

7.28 If the expansion of agricultural resources and agro-processing is to provide a platform for subsequent development of manufacturing activity on a continuous basis, it is necessary to look towards the next stage, and further linked development. Those links which have been forged need to be extended.

7.29 A major constraint here appears to be a lack of purchasing power in the rural areas. This is supported by an analysis carried out here of income distribution data derived from the agro-economic surveys, which shows a general lack of access by smallholders to cash crops.

7.30 This lack of access is clearly associated with the emphasis on estate production. In the light of this it can be argued that the emphasis on estates as the 'engine of growth' during the 1970s was misplaced from the point of view of long term strategy, however effective it proved in generating short-term growth.

7.31 **It is to be emphasised that Malawi has also had major integrated rural development programmes directed towards smallholders, and now has a national programme. Some aspects of these programmes have been very successful. It is particularly in terms of differential access to the major cash crops, partly generated by the pricing policies pursued in Malawi, that smallholders can be said to have been disadvantaged. Thus while Malawi has avoided the 'urban bias' associated particularly with an import-substituting industrialisation strategy, it may have unconsciously introduced a significant 'formal sector bias'.**

7.32 **The prospects for increasing access by smallholders to cash crops are worsened if one takes account population increase. The majority of farms are already very small and are likely to decrease significantly in size within the next 10-15 years. Given that the main food crop, maize, is land-intensive, land availability for cash crop production will decrease. To release land for this purpose, it will be essential to intensify maize production through improved varieties and other measures.**

7.33 **More generally, efforts to intensify smallholder agriculture need to be stepped up with more research and development of food and cash-producing combinations of farm activities, supported by appropriate technical packages.**

7.34 **The findings of the Estates Diversification Study indicate a significant element of inefficiency within a major portion of the estate sector and a wider degree of land underutilization. Steps obviously need to be taken to reduce this, but the policy should not be merely one of diversification within fixed estate boundaries but wider reconsideration of the best use of land, including diversification into smallholder cropping.**

7.35 **More direct in its impact on rural purchasing power has been agricultural price policy which, it is argued, has imposed an onerous tax burden on the smallholder sector and produced a shift in the relative rates of return to labour between the smallholder and estate sector, leading to a transfer of financial and labour resources from one to the other.**

7.36 **Relative as well as absolute levels of producer prices need to be reviewed in relation to export and import parities, so that they will give the appropriate signals to producers.**

7.37 While the need to encourage labour-intensive manufacturing activities is increased by the expanding numbers of population, what the effect of the low-wage policy pursued in Malawi has been in this direction is not as clear as has been supposed. Re-examination of available data on employment elasticities shows that these are sensitive to choice of base years and of sectors, and we should be cautious in using them in ascribing satisfactoryrates of employment growth relative to output to the low wage policy adopted. This is accentuated by the fact that labour transfer has been between the smallholder and the estate sectors rather than between the agricultural and urban manufacturing sectors.

7.38 Given the expansion of population and labour supply, it remains worth while to encourage labour-intensive methods of production. Although, in addition to adopting a low wage policy, Malawi has imposed customs duty on imported capital goods, it is likely that the impact of this duty is outweighed by a variety of investment allowances which subsidize the use of capital. It would be desirable to review these.

7.39 The emphasis on resource-based developement remains sound, despite the limitations observed. Given the handicap of its landlocked position, particularly, with its disadvantages of transport costs and physical trading bottlenecks, Malawi needs to supplement this by making the most of all of its resources, including labour. In developing labour-based industries, it is desirable, therefore, to be progressively raising labour skills in the country. Advantage can be taken here of the experience obtained by Malawian labour abroad. At present Malawian firms lack incentives to train labour on-the-job or to pay for technical training away from work, since labour once trained may not remain with the firm. In the light of this social/private divergence, tax relief or other measures to share the cost of training should be considered.

7.40 Identification of potential skilled labour-intensive small industry, supported by necessary training and technical assistance, perhaps through SEDOM, should be carried out. Such small industry, even where it requires some use of imported materials, may have export possibilities but in particular may fill small niches provided by the domestic market.

7.41 Existing small industry in Malawi is quite dynamic, providing direct competition with the formal sector in such areas as brickmaking, tailoring, fishing and processing, and agricultural implements. This small-scale industry, particularly in the rural areas, is often resource-based, and has the further advantage of labour-intensity. While the sector has been the subject of some study, few resources have so far been channelled into this sector, and the best means of doing this remains undecided.

7.42 Within small industry, a clear distinction needs to be made between small factory industry and very small craft enterprises. Different forms of assistance are appropriate to each.

7.43 Craft industry, rural and urban, makes a significant contribution to employment and income in Malawi, but is seriously undercapitalized. Workshop clusters, the provision of very simple premises in convenient locations, with improved access to materials, is likely to be the most effective way of developing such enterprises. Designs to date have been inappropriate. In general the approach should be to assist and upgrade the existing types of enterprises rather than attempting to transform them into modern factory-type enterprise.

7.44 Workshop clusters located in some of the main townships in Malawi could serve as focal points for the distribution and supervision of credit to larger rural enterprises such as saw-mills or lime-manufacturers, as in Kenya.

7.45 How SEDOM can best be organized to deal with craft enterprise and small factory industry, and to provide for both urban and rural development, remains undecided. At present available resources of finance and expertise appear too small to cover the range of activities required.

7.46 Many of the industrial projects identified for possible implementation in Malawi, and under consideration by the Ministry of Trade and Industry, are of the small factory type, too small, however, to interest foreign equity investment. This raises a problem of implementation, because of a second major obstacle identified here, that of an 'entrepreneurial gap' between the medium or large concern with foreign or parastatal participation and the very small-scale informal enterprise, including the large numbers of self-employed artisans. The development of small factory industry in the face of this entrepreneurial gap, including problems of technical know-how, is especially problematic, and no easy solution exists.

7.47 It should be noted that, while the parastatal development corporations within Malawi appear to be comparatively well managed, their investments are concentrated in the high-revenue, low-risk sectors, implying a comparatively conservative policy in relation to the requirements of long run development. An associated problem is that of channeling finance towards small-scale and rural activities, as a large portion of the available finance being created within Malawi is to a great degree internalized within a system of overlapping parastatal companies. Where MDC or the other parastatals do not feel able directly to establish intermediate-scale activities there may be scope for collaboration between the parastatal and SEDOM in promoting the enterprise.

7.48 A limitation exists here in the identification and definition of projects which would be worth pursuing. Existing project appraisal capacity within the Ministry of Trade and Industry and within the Economic Planning Division of the Office of the President remains very inadequate and needs to be expanded as a matter of some priority.

APPENDIX I

Value of Different Commodity Imports into Malawi, 1981 (K'000)

* indicate possibilities for resource-based import substitution

Chickens	179
Cattle and other live animals	10
Live animals	189
Mutton etc.	63
Other meat	37
Meat	100
Fish	41
*Fish, smoked or preserved	91
Crustaceans, etc.	23
All fish	156
Milk, fresh, preserved, powdered for infants	689
*Dairy produce: powder or granules	2,146
Dairy produce, other	2,260
*Honey	7
Edible products of animal origin, nes.	17
	5,125
Sausage casings, etc.	98
Bulbs, flowers, etc.	12
Vegetables, fresh and frozen	58
*Fruits, fresh and preserved	258
Coffee and mixtures	162
Spices	88
Other	1
	579
SECTION	6,247
*Wheat	5,230
*Rice	2,031
Other cereals	1,418
	8,680
*Flour and meal	732
Starches, malt, etc.	699
	1,431
Nuts, seeds, etc.	71
Tallow, animal, fish fats	2,909
*Soya bean oil	729
*Sunflower oil	381
Coconut oil	163
Other vegetable oils	42
Glycerol, etc.	96
Hydrogenated oils and fats	331
*Margarine, etc.	361
Other fats	4
	5,018
Prepared meat and extracts	124
Fish preparations, etc.	210
	334
*Sugar, raw or refined	100
*Glucose	123
*Syrup, etc.	42
Sugar confactionery	63
	328
Cocoa products, etc.	87
Flour preparations, etc.	70
Macaroni, etc.	20
Tapioca, cereal foods, etc.	122
Biscuits, bread, etc.	84
	296
SECTION	16,559
Pickles	60
Other preserved vegetables	79
*Jams and fruit preparations	160
*Fruit and vegetable juices	88
	387
Coffee extracts, etc.	21
*Tea extracts	540
Condiments, sauces, etc.	70
Soups	46
Misc. foods	435
	1,112
Aerated waters	12
Beer	9
*Wines, etc.	539
*Spirits	569
Vinegar	6
	1,143
*Fish meal	158
*Other food residues and animal fodder	114
	272
*Tobacco, cigarettes, etc.	1,715
*Cement	2,934
*Lime	526
Common salt	1,579
Salt sulphur	97
Calcium phosphates, etc.	29
Sand, gravel, etc.	1
	5,266
*Coal, etc.	3,679
*Petroleum, spirits, fuel	45,117
Fuel oils, etc.	3,901
Paraffin	2,081

Appendix I (continued)

*Wax	64
Bitumen	1,520
	56,461
Sulphur, sulphuric acid	564
Carbon, oxygen, hydrogen	23
Caustic soda	1,492
Calcium carbide	109
Sodium compounds	970
Chemical elements, etc.	2,013
Medicinal goods	90
	5,271
Hydrocarbons	212
Organic/unorganic compounds	2,556
*Insecticides	104
Sweetening agents	1
	2,873
SECTION	74,598
Vaccines, etc.	666
Medicaments, etc.	5,270
Disinfectants, etc.	135
*Bandages, etc.	561
	6,632
Sodium/ammonium nitrate	461
*Ammonium sulphate	4,649
*Calcium/ammonium nitrate, etc.	1,218
*Urea	2,422
*Nitrogenous fertiliser, nes.	764
*Superphosphates, phosphatic fertilisers	3,221
*Potassium, potassic fertilisers, etc.	2,185
	14,921
Tanning extracts, etc.	29
Dyes, pigments, etc.	1,303
Paints, varnishes, etc.	307
Putty, etc.	205
Inks, etc.	294
	2,238
Essential oils, etc.	1,197
Toothpaste, etc.	319
Shampoos	17
Cosmetics	236
	1,770
*Soap	260
Washing preparations	569
*Polish, waxes, etc.	683
*Candles, etc.	81
	1,591
*Glue, etc.	762
Explosives, etc.	664
*Matches	5
	669
Films, etc.	700
Refractory cements, etc.	451
*Agricultural disinfectants, insecticides	2,788
Misc. chemical products	1,701
Solvents, etc.	220
	5,160
Plastics, etc.	8,047
SECTION	41,694
Natural and synthetic rubber	28
*Foam rubber and flooring	49
Tyres and tubes	4,823
Other rubber items	1,734
	6,684
*Leather	278
*Leather goods, including travel	175
*Plastic and other travel goods	92
Other	1
	546
Furskin articles, etc.	9
*Timber for woodpulp	8
*Timber, sawn or squared	988
Hoopwood, etc.	322
*Block and fibre board	795
*Plywood, veneers, etc.	651
Other wood	43
*Wood products	158
	3,091
Cork products	14
Straw articles	2
*Newsprint	341
Printing paper	6,060
*Craft paper and paper-board	2,853
*Box files, etc.	990
Exercise books, etc.	696
Other paper products	1,876
	12,716
Books, periodicals, etc.	1,755
SECTION	24,905
Yarn and fabrics	651
Wool fabric and yarn	97
*Cotton fabrics and yarn	2,406
Other fabrics and yarn	6,809
Jute, sisal mats, etc.	722
Carpets, etc.	161
Woven fabrics, etc.	181
Mosquito netting, etc.	47
	11,074
*Fishing nets	32

Appendix I (continued)

Rope and twine	336
Wadding, etc.	69
Felt and felt articles	158
Floor covering and misc.	565
	1,160
SECTION	12,262
*Knitwear	797
*Garments	1,706
*Rugs and blankets	68
*Towels, cloths, etc.	61
*Bedsheets, linen, etc.	313
*Sacks and bags	1,694
Tarpaulins, sails, tents, etc.	988
	3,125
Used clothing and footwear	524
*Footwear	1,287
Headgear	187
Umbrellas, etc.	130
Artificial flowers, wigs, etc.	12
*Monumental stones, grinding wheels, etc.	107
Insulating materials	4
Plaster, cement, bonded materials	249
Asbestos materials, etc.	1,568
Friction materials, etc.	473
	2,401
*Bricks and tiles	262
Ceramic items including tiles	695
	957
*Plate glass	855
*Mirrors	112
*Bottles, jars, etc.	561
*Domestic glassware	154
Other glass and products	563
	2,562
*Precious stones, metal, etc.	117
Iron and steel products	30,377
Copper and articles	470
Nickel and articles	32
Aluminium and products	2,075
Magnesium articles	negl.
Lead and articles	66
Zinc and articles	24
SECTION	46,849
Tin and articles	1
*Agricultural hand tools	181
*Domestic hand tools	45
Other tools, knives, etc.	1,580
Cutlery, etc.	504
Machines for food preparation	6
	2,317
Small basemetal articles, etc.	3,596
Boilers, engines, pumps, etc.	29,991
*Ploughs	54
*Cultivators	13
*Plough parts	86
Agricultural machinery	275
	30,959
Electrical appliances, etc.	30,965
Tractors	3,696
Motor vehicles, cycles, etc.	36,122
	39,818
Rolling stock, etc.	5,118
Aircraft, etc.	9,897
Vessels, etc.	1,714
SECTION	124,385
Spectacles, photographic equipment	5,309
Clocks, etc.	180
Musical instruments, etc.	619
Firearms, etc.	34
*Furniture, mattresses, etc.	1,108
Carvings, etc.	negl.
*Brooms, brushes, etc.	248
Toys, games, etc.	348
Buttons, pens, etc.	721
Works of art, etc.	7
SECTION	8,594
GRAND TOTAL	357,207**

Source: Draft Annual Trade Report, 1981.

(**Totals and sub-totals may not always add exactly in this preliminary data)

Table 1.1 The Share of Investment and Saving in GDP

	1964	1970	1975	1978	1979	1980
GDP at 1970 market prices (K million)	183.9	231.6	335.3	460.4	478.6	480.6
	Per cent of GDP at 1970 market prices					
GDP at 1970 market prices	100	100	100	100	100	100
Investment	7.8	26.0	28.5	37.2	28.0	21.7
National savings	-3.7	11.0	11.5	20.4	9.2	8.7
Including domestic savings	-0.3	13.3	10.1	20.9	12.5	11.2

Source: Malawi Country Review, Government of Malawi, 1981.

Table 1.2 Gross Domestic Product by Industrial Origin

	GDP at 1970 prices (K millions			Percentage of total			Percentage of monetary GDP			Percentage increase 1980 over 1970
	1964	1970	1980	1964	1970	1980	1964	1970	1980	
Agriculture	101.8	126.0	191.4	57.3	50.5	42.6	-	-	-	51.9
Monetary	26.2	38.2	70.4	14.7	15.3	15.7	28.8	25.7	22.5	84.3
Non-monetary	75.6	88.1	121.0	42.5	35.3	26.9	-	-	-	-
Manufacturing/Mining	16.4	31.7	58.0	9.2	12.7	12.9	-	-	-	83.0
Monetary	10.8	25.2	50.6	6.1	10.1	11.3	11.9	17.1	16.2	100.8
Non-monetary	5.6	6.5	7.5	3.1	2.6	1.7	-	-	-	-
Construction	6.7	12.1	23.1	3.8	4.9	5.1	-	-	-	90.9
Monetary	4.0	8.5	19.3	2.2	3.4	4.3	4.4	5.8	6.2	127.1
Non-monetary	2.8	3.6	3.8	1.6	1.4	0.8	-	-	-	-
Electricity/Water	1.3	2.9	7.1	0.7	1.2	1.6	1.4	2.0	2.3	144.8
Distribution	14.3	24.6	57.9	8.0	9.9	12.9	15.7	16.7	18.5	135.4
Transportation	6.7	10.1	24.4	3.8	4.1	5.4	-	-	-	141.6
Monetary	6.2	9.5	23.5	3.5	3.8	5.2	6.8	6.4	7.5	147.4
Non-monetary	0.5	0.9	0.9	0.3	0.3	0.2	-	-	-	-
Banking/Real Estate	5.1	9.2	33.7	2.9	3.7	7.5	-	-	-	266.3
Monetary	2.6	6.1	29.9	1.5	2.4	6.6	5.6	6.2	10.8	390.2
Non-monetary	2.5	3.0	3.8	1.4	1.2	0.2	-	-	-	-
Public Administration	25.5	32.7	54.1	14.3	13.1	12.0	28.1	22.2	17.3	65.4
TOTAL	177.8	249.3	499.7	100	100	100	-	-	-	80.4
Monetary	90.9	147.4	312.7	51.1	59.1	69.6	100	100	100	112.1
Non-monetary	86.9	101.9	136.9	48.9	40.9	30.4	-	-	-	34.3

Source: Malawi Country Review, Government of Malawi, 1981.

Table 1.3 The Structure of Malawi's Merchandise Exports

(average, 1977-80)

	US $m.	%	
Tobacco	114.0	50.0	
Tea	38.9	17.0	78%
Sugar	24.9	10.9	
Groundnuts	11.5	5.0	
Cotton	2.7	1.2	22%
Other	36.3	15.9	
Total	228.2	100.0	

Source: Statistical Yearbook.

Table 1.4 Composition of Domestic Exports by Main Commodities, 1964-80 (K million)

	1964	1970	1976	1977	1978*	1979	1980[1]
Smallholder Crops	12.2	17.9	46.1	55.6	43.2	47.8	41.3
Tobacco	5.8	8.2	28.0	37.1	32.7	31.5	17.9
Groundnuts	2.2	4.2	11.2	8.9	4.7	8.9	15.9
Cotton	2.0	2.8	2.3	2.4	0.3	1.6	4.5
Rice	-	0.6	1.5	2.5	2.1	2.2	3.0
Others	2.2	2.1	3.1	4.7	3.4	3.6	-[2]
Estate Crops	9.8	19.7	86.8	104.9	97.0	126.0	154.1
Tobacco	2.6	8.2	36.9	47.9	55.9	72.4	87.5
Tea	6.6	10.9	26.4	41.6	29.2	30.7	30.3
Sugar	-	0.2	23.2	14.9	11.4	20.2	36.3
Others	0.6	0.4	0.3	0.5	0.5	2.7	-[2]
Manufactured and Other Exports	1.0	3.0	8.1	11.5	10.1	10.9	30.6[2]
Total Domestic Exports	23.0	40.6	141.0	172.0	150.3	184.5	226.0

1/ Preliminary.

2/ "Other" smallholder and estate crops are included in "Manufactured and Other Exports".

Source: Economic Report, 1981.

Table 1.5 Share of Smallholder and Estate Crops in Domestic Exports

	1964	1969	1973	1974	1979	1980[1/]
Smallholder Crops	53.0	49.5	40.7	35.6	25.6	18.3
Tobacco	25.2	17.5	17.4	16.9	17.1	7.9
Groundnuts	9.6	15.3	8.6	14.2	4.8	7.0
Cotton	8.7	4.6	2.8	3.0	0.9	2.0
Rice	-	0.8	3.8	3.3	1.2	1.3
Others	9.6	11.2	8.1	6.6	2.0	-
Estate Crops	42.6	44.3	51.6	56.8	68.3	68.2
Tobacco	11.3	16.9	26.5	27.0	39.2	38.7
Tea	28.7	26.0	20.1	19.2	16.6	13.4
Sugar	-	0.5	4.8	10.3	10.9	16.1
Others	2.6	0.8	0.3	0.3	1.5	-
Manufactured and other exports	4.3	6.3	7.7	7.6	5.9	13.5
Total domestic exports	100	100	100	100	100	100
of which Tobacco	36.5	34.4	43.9	43.9	56.3	46.6

Source: Statistical Yearbook.

Table 1.6 Indices of Volume and Unit Values of Imports and Domestic Exports, 1965-80

Period	Imports		Domestic Exports	Exports	Terms of Trade 1/
	Volume	Unit Value	Volume	Unit Value	
1965	47.5	26.4	40.0	37.8	143.2
1966	61.6	27.0	51.7	35.5	131.5
1967	56.6	27.6	67.4	32.0	115.9
1968	60.6	29.4	57.0	37.2	126.5
1969	63.7	29.6	60.1	38.6	130.4
1970	68.6	31.9	59.0	44.4	139.2
1971	79.4	34.7	64.7	48.3	139.2
1972	85.5	36.9	71.2	47.7	129.2
1973	80.2	43.8	79.4	53.0	121.0
1974	83.7	57.8	72.7	73.5	127.2
1975	98.6	68.0	74.7	86.1	126.6
1976	78.5	73.7	79.8	100.1	135.8
1977	81.0	79.5	84.4	112.7	141.8
1978	99.7	87.7	76.3	108.5	123.7
1979	100.0	100.0	100.0	100.0	100.0
1980 2/	96.2	113.3	115.1	105.4	93.0

1/ Calculated as $\frac{Px}{Pm} \times 100$, where Px is unit value index for exports and Pm is unit value index for imports.

2/ Preliminary.

Source: World Bank estimates.

Table 1.7 Index of Imports of Petrol and Lubricants

	Quantum	Unit Value	Value
1970	100.00	100.00	100.00
1973	122.04	116.53	142.21
1974	110.48	214.11	236.55
1978	130.13	359.05	467.33
1979	134.99	510.73	689.43
1981*	116.75	628.85	734.18

*estimated.

(Source: Economic Report)

Table 1.8 Commodity and Income Terms of Trade for Malawi 1975-81

	1975	1976	1977	1978	1979	1980	1981
Commodity terms of trade (1970=100)	81.2	89.3	94.1	84.3	66.6	56.6	57.0
Income terms of trade (1970=100)	112.3	116.2	155.0	132.6	134.1	136.0	103.2

(Source: Economic Report)

Table 1.9 Changing Economic Fortunes in Malawi: Sectoral Changes in GDP Growth Rates Pre- and Post-1979

Sector	Average annual rate of growth of GDP at 1978 constant factor cost (%)	
	1973-79	1979-81
Smallholder agriculture	4.5	0.4
Estate agriculture	11.5	0.2
Manufacturing	5.8	4.3
Utilities	8.3	8.0
Building and construction	7.6	-15.1
Distribution	8.0	-1.5
Transport and communications	2.1	-1.6
Financial and professional services*	17.4	2.8
Ownership of dwellings	7.5	2.1
Social and community services	1.4	1.8
Government	5.1	8.3
GDP at factor cost	6.1	0.5

(Source: Economic Report, 1982)

*Net unallocable finance charge

Table 2.1 Manufacturing Value Added at Constant 1978 Factor Cost (Kmn): Composition and Growth

	No. of firms in 1979	1973	1974	1975	1976	1977	1978	1979	Increase 1973-79 (Kmn)	(% of total)	Percentage increase 1973-79	1973-75	1975-79
Food processing including sugar	9	5.1	5.0	6.0	7.0	7.7	7.6	8.8	3.7	15.3	72.5	17.6	46.7
Tea manufacturing	18	3.5	2.9	4.0	4.0	4.5	3.9	4.4	0.9	3.7	25.7	14.3	10.0
Beverages	4	2.7	4.4	6.5	5.4	4.9	6.1	6.6	3.9	16.1	144.4	140.7	1.5
Tobacco manufacture	6	4.1	5.1	6.2	6.9	8.8	8.8	8.2	4.1	16.9	100.0	51.2	32.3
Textiles, netting and blanket manufacture	8	3.4	4.7	4.9	5.3	5.1	5.6	5.7	2.3	9.5	67.6	44.1	16.3
Clothing, leather goods and footwear	15	1.7	1.9	2.2	1.8	2.2	2.1	2.4	0.7	2.9	41.2	29.4	9.1
Sawmill and wood products	7	2.0	2.2	2.6	2.3	2.3	2.4	3.2	1.2	5.0	60.0	30.0	23.1
Packing materials, printing and publishing	9	1.4	2.2	3.7	2.8	3.1	3.8	3.2	1.8	7.4	128.6	164.3	-13.5
Chemicals and fertiliser	3	1.0	1.3	2.2	1.7	1.7	2.2	2.8	1.8	7.4	180.0	120.0	27.3
Pharmaceuticals, paints, soaps and cooking oils	7	5.3	5.2	4.9	4.8	4.2	4.7	4.5	-0.8	-3.3	-15.1	-7.5	-8.2
Tyre retreading and plastic products	7	0.7	0.9	1.2	1.1	1.1	1.3	1.7	1.0	4.1	142.9	71.4	41.7
Non-metallic mineral products	4	3.1	3.5	3.9	3.4	3.1	3.9	5.3	2.2	9.1	71.0	25.8	35.9
Metal products other than machinery	12	2.1	3.0	4.1	3.2	3.5	3.3	4.0	1.9	7.9	90.5	95.2	-2.4
Machinery and motor vehicle assembly	3	2.5	2.9	4.2	3.9	2.7	2.4	2.0	-0.5	-2.1	-20.0	68.0	-52.4
All other manufactures	5	1.2	1.4	1.1	1.3	1.1	1.5	1.3	0.1	0.4	8.3	-8.3	18.2
ALL MANUFACTURES	117	39.9	46.4	57.8	54.7	56.0	59.7	64.1	24.2	100	60.7	44.9	10.9
ALL ACTIVITIES	417	178.6	204.7	233.0	235.4	232.9	276.8	291.5	112.9				

Source: NSO

Table 2.2 Index of Manufacturing Output, 1970-81 (1970=100)

	Weight %	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981
Consumer Goods Mainly for the Domestic Market of which:	62	113.2	120.9	150.4	171.7	194.8	194.6	212.8	236.2	234.7	252.5	303.9
Food, Beverages, Tobacco	33	112.3	127.6	169.4	192.1	225.7	238.6	259.8	274.4	273.9	292.9	374.5
Footwear, Clothing, Textiles	14	118.1	118.8	115.2	120.1	130.2	109.9	126.2	148.3	169.2	149.4	170.6
Other Goods	15	110.8	108.0	142.4	175.1	187.3	176.8	190.2	234.3	205.2	259.7	273.0
Intermediate Goods Mainly for Building and Construction	18	103.1	122.9	147.6	129.0	157.6	128.6	142.9	166.8	172.4	150.4	124.3
Total Manufacturing Mainly for the Domestic Market	80	111.0	121.3	149.9	162.1	186.5	179.8	197.1	220.6	220.3	229.5	263.5
Export Industries	20	108.7	125.4	137.7	131.6	154.0	172.3	207.3	217.3	220.2	201.6	180.6
Total Manufacturing	100	110.6	122.0	147.4	156.0	180.0	178.7	199.1	219.9	220.7	223.9	246.9

Source: National Statistical Office (NSO) Statistical Bulletin.

Table 2.3 Employment in Manufacturing ('000): Composition and Growth

	1973	1974	1975	1976	1977	1978	1979	Increase 1973-79 '000	Increase 1973-79 % of total	Percentage increase 1973-79
Food processing, including sugar	2.3	3.6	4.1	4.2	3.8	4.1	4.4	2.1	17.6	91.3
Tea manufacturing	3.5	4.0	4.1	4.2	4.5	4.3	4.8	1.3	10.9	37.1
Beverages	0.9	1.0	1.2	1.4	1.4	1.5	1.6	0.7	5.9	77.8
Tobacco manufacture	6.7	6.3	6.1	7.5	8.2	8.6	8.9	2.2	18.5	32.8
Textiles, netting and blanket manufacture	2.9	3.0	3.1	3.2	3.7	3.9	4.1	1.2	10.1	41.4
Clothing, leather goods and footwear	1.4	1.5	1.5	1.6	1.8	1.9	2.0	0.6	5.0	42.9
Sawmill and wood products	1.1	0.9	1.4	1.4	1.5	1.7	1.8	0.7	5.9	63.6
Packaging materials, printing and publishing	0.7	0.8	1.2	1.0	1.0	1.0	1.2	0.5	4.2	71.4
Chemicals and fertilizer	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.2	1.7	200.0
Pharmaceuticals, paints, soaps and cooking oils	0.8	0.8	0.9	1.0	1.0	1.0	1.1	0.3	2.5	37.5
Tyre retreading and plastic products	0.3	0.2	0.3	0.4	0.4	0.5	0.6	0.3	2.5	100.0
Non-metallic mineral products	1.4	1.5	1.6	1.7	1.9	1.9	2.0	0.6	5.0	42.9
Metal products other than machinery	1.0	1.4	1.3	1.4	1.5	1.5	1.7	0.7	5.9	70.0
Machinery and motor vehicle assembly	0.3	0.3	0.3	0.3	0.3	0.5	0.4	0.1	0.8	33.3
All other manufactures	0.5	0.5	0.8	0.7	0.7	0.7	0.9	0.4	3.4	80.0
ALL MANUFACTURES	24.0	26.0	28.1	30.2	31.7	33.3	35.9	11.9	100	49.6
ALL ACTIVITIES	132.6	139.9	154.3	171.7	184.1	201.0	205.3	72.7		54.8

Source: NSO

Table 2.4 The Composition of Manufacturing Value Added and Employment in 1979

	Value added at constant 1978 factor cost			Employment		
	(Kmn)	%		('000)	(%)	
Food and beverages including sugar (excluding tea and tobacco)	15.4	24.0		6.0	16.7	
Tea manufacturing	4.4	6.9		4.8	13.4	
Tobacco manufacture	8.2	12.8	61.3	8.9	24.8	76.9
Textiles and leather	8.1	12.6		6.1	17.0	
Wood and wood products	3.2	5.0		1.8	5.0	
Paper and printing, etc.	3.2	5.0		1.2	3.3	
Chemicals, paints, tyres, plastic products, etc.	9.0	14.0		2.0	5.6	
Non-metallic minerals	5.3	8.3		2.0	5.6	
Metal products, machinery and equipment	6.0	9.4		2.1	5.8	
Other manufactures	1.3	2.0		0.9	2.5	
ALL MANUFACTURES	64.1	100		35.9	100	

Source: Tables 2.1 and 2.3

Table 2.5 Increases in Monetary GDP and Wage Employment, 1973-76

Sector	Average annual percentage increase in		(b) : (a)
	(a) Monetary GDP	(b) Wage Employment	Employment elasticity
Agriculture, forestry, and fishing	7.9	10.3	1.30
Manufacturing	6.1	11.9	1.95
Construction	5.2	-0.2	-
Electricity and water	11.8	3.8	0.32
All other sectors	7.4	5.1	0.69
TOTAL	7.1	7.4	1.04

Source: IBRD, Memorandum, p. 14.

Table 2.6 IBRD Calculations of Formal Sector Employment Elasticities, 1968-77 and 1977-79[1/]

	1968-77	1977-79
Agriculture, forestry and fishing	-[2/]	1.03
Manufacturing, mining and quarrying	0.98	0.47
Electricity and water	0.83	1.49
Building and construction	0.41	1.29
Wholesale/retail trade, hotels and restaurants	0.87	1.02
Transport, Storage and Communications	0.70	2.39
Financial, insurance and real estate	0.78	0.72
Community, social and personal services	1.72[3/]	0.64
Total employment elasticity	0.76	1.13

1/ The elasticity is the ratio of the employment growth rate to the value added growth rate. Elasticities for 1968-77 have been computed by taking averages for sectoral real value added and for employment for the years 1968-70 and 1975-77 and then calculating the growth rate of the period averages for each. The elasticities for 1977-79 were computed by taking the growth rates for employment and real value added between these years. For 1968-77, "old series" employment figures were used while for 1977-79 "new series" figures were used.

2/ No estimate can be made because there is no time series data on real value added in the estate sector for the period.

3/ Elasticity is for the period 1968-76.

Source: IBRD, Basic Economic Report, 1982, Table 15.

Table 2.7 Employment Elasticities in Malawian Manufacturing, Based on Recent Data[1]

	Elasticities 1973-75	1975-79	1973-79
Food processing, including sugar	-	-	1.26
Tea manufacturing	-	-	1.44
Beverages	-	-	0.54
Tobacco manufacture	-	-	0.33
Textiles, netting and blanket manufacture	-	-	0.61
Clothing, leather goods and footwear	-	-	1.04
Sawmill and wood products	-	-	1.06
Packing materials, printing and publishing	-	-	0.56
Chemicals and fertilizer	-	-	1.11
Pharmaceuticals, paints, soaps and cooking oils	-	-	-2.48
Tyre retreading and plastic products	-	-	0.70
Non-metallic mineral products	-	-	0.60
Metal products other than machinery	-	-	0.77
Machinery and motor vehicle assembly	-	-	-1.67
All other manufactures	-	-	9.64
ALL MANUFACTURES	0.38	2.55	0.82

(Source: Tables 2.1 and 2.3)

[1] Elasticities calculated as percentage change in employment over the period divided by the percentage change in value added, using the recently issued corrected data.

Table 2.8 Geographical Distribution of Employment in Manufacturing, 1976

Location	Share of employment %
Blantyre	60.3
Lilongwe	6.4
Zomba	2.2
Mzuzu	0.3
Total, 4 leading towns	69.2
Rural and small urban places	30.8
Total (%)	100
Total ('000)	36.0

Notes: Figures for Blantyre are inflated by senior staff paid centrally but actually working elsewhere. Those for Lilongwe will have increased since 1976.

Data is for firms hiring 20 or more persons.

Source: NSO

Table 2.9 Size Distribution of Industrial Plants, Recent Figures

INDUSTRY	Number of Employees										
	1-9	10-19	20-39	40-59	60-99	100-199	200-499	500-999	1000-1999	2000+	TOTAL
Food processing including sugar	105	11	7	3	2	5	7	3	0	1	144
Tea manufacture	2	0	1	0	2	8	12	4	0	0	29
Beverages	1	0	1	1	1	1	4	0	0	0	9
Tobacco manufacture	0	0	0	1	0	1	2	1	3	0	8
Textiles, netting and blanket manufacture	2	0	1	0	1	3	2	0	0	1	10
Clothing, leather goods and footwear	14	2	5	4	4	4	5	1	0	0	39
Sawmill and wood products	10	4	4	6	2	3	5	2	0	0	36
Packing materials, printing and publishing	3	2	3	2	4	0	2	2	0	0	18
Chemicals and fertilizers	1	1	1	0	2	0	1	0	0	0	6
Pharmaceuticals, paints, soaps and cooking oils	0	2	4	1	3	0	0	2	0	0	12
Tyre retreading and plastic products	1	1	1	3	4	0	1	0	0	0	11
Non-metallic mineral products	2	4	4	1	1	3	1	0	2	0	18
Metal products other than machinery	8	2	5	2	5	5	2	0	0	0	29
Machinery and motor vehicle assembly	3	1	1	1	2	2	2	0	0	0	12
All other manufactures	7	3	2	0	0	0	1	0	0	0	13
TOTAL	159	33	40	25	33	35	47	15	5	2	394

Source: NSO

Table 2.10 Size Distribution of Firms Engaged in Construction, Recent Figures

No. of employees	1-9	10-19	20-39	40-59	60-99	100-199	200-499	500-999	1000-1999	2000+	TOTAL
No. of firms	33	8	16	13	27	21	34	9	6	4	171

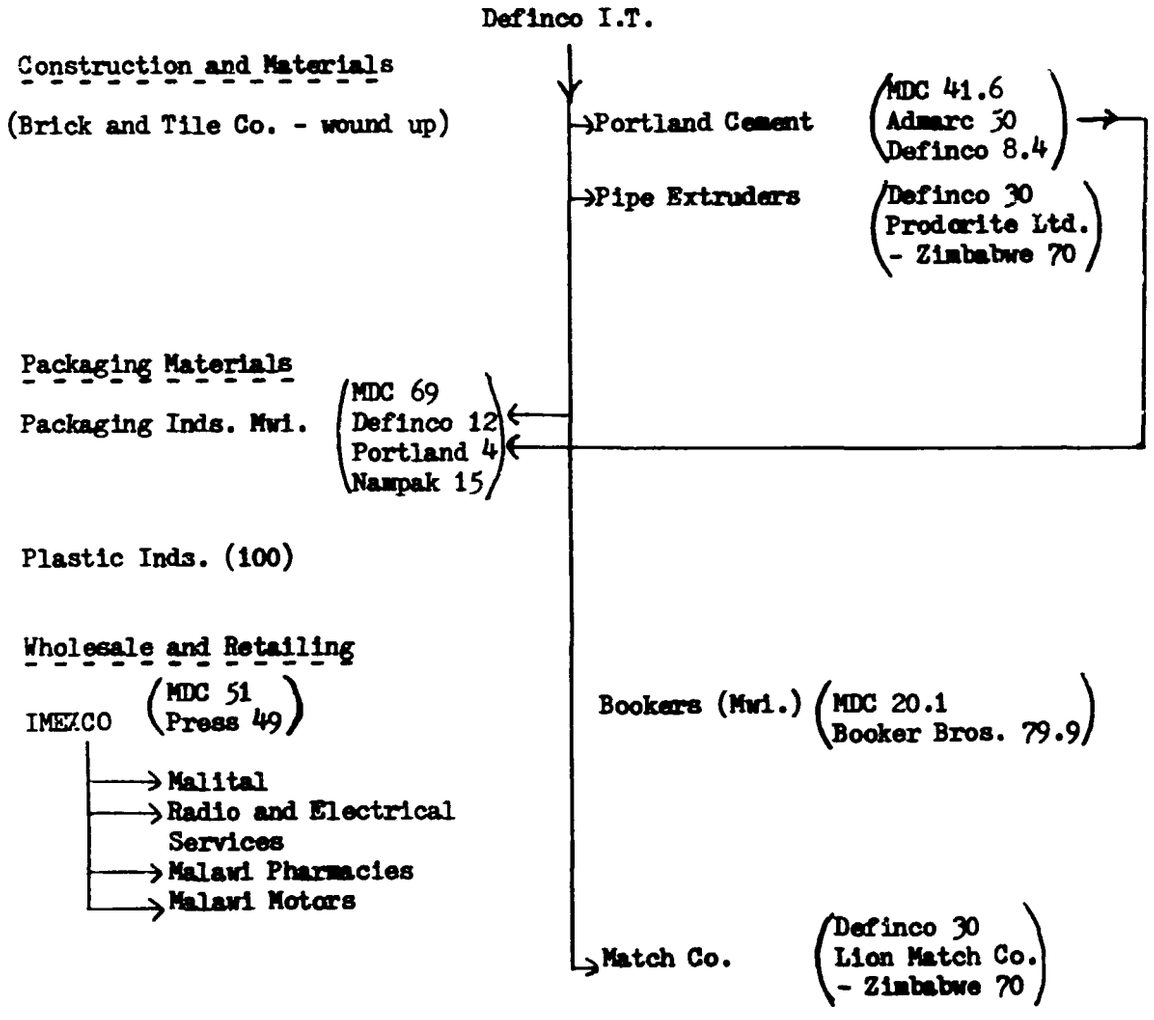
Source: NSO

Table 2.11 Shareholdings of the Malawi Development Corporation in Subsidiary and Associated Companies, 1979

Subsidiary Companies	Associated Companies
Food, Beverages and Milling	
Cold Storage Co. (100) Fresh Cold Fisheries (85) — Maldeco Fisheries (100); Chriscold Fisheries (100)	Carlsberg (Mwi.) (MDC 27, Press 24, Utd. Breweries - Denmark 47) Malawi Distilleries (MDC 40.8, Press 20, International Distilleries 39.2) NOIL Ltd. (MDC 30, Press 20, Admarc 50)
Textiles and Knitwear	
Merolga Knitwear	David Whiteheads, Mwi. (MDC 29, Press 20, D. Whitehead and Sons/Lonrho 51)
Metal Products	
	B and C Metal Products (MDC 25, Brown and Clapperton 75) AGRIMAL (MDC 40, Press 40 Massey Ferguson 20) Encor Products (23.3)
Tourism, Hotels and Catering	
	Malawi Hotels (MDC 47.4, CDC 26.3, Carlsberg, Mwi. 26.3) United Touring, Mwi. (MDC 30)
Finance and Property	
Jacaranda Properties (51)	Commercial Bank of Mwi. (MDC 20, Press 40, Admarc 10, Bank of America 30)

Definco (87.8)
- City Developments (76.9) (Def. Inv. Trust 23.1)
- Namiwa Estates (100)
- Definco Investment Trust (100)

Table 2.11 (continued)



Note: Percentage shareholding in brackets. If unspecified, refers to MDC shareholding.

Source: MDC Annual Report, 1979.

Table 2.12 Ordinary Shares Held by ADMARC in Various Enterprises, March, 1981

	Value of shares at cost (K'000)	Percentage of issue shares held (%)
Banks and finance		
Commercial Bank of Malawi	230	10
National Bank of Malawi	2,014	33
Indebank	895	25
Finance Corporation of Malawi	220	100
Marketing and distribution		
Auction Holdings	853	52
United Transport (Malawi)	1,392	35
Manica Freight Services	500	50
Agro-Processing		
Dwangwa Sugar Corporation	10,228	38
Sugar Corporation of Malawi	1,800	20
National Oil Industries (rice-milling, cotton seed oil)	764	50/100
Lever Bros. (Malawi)(soap, edible oils)	575	20
Cotton Ginners Ltd.	252	49
Grain and Milling Co.	240	50
ADMARC Canning Co.	40	100
Agricultural Estates	220	-
Agricultural Inputs		
National Seed Co.	580	72.5
Optichem Ltd. (fertilizer)	140	20
Cattle Feed Lot Co.	70	25
Mineral-based Industry		
Portland Cement Co.	2,750	50
Second-stage manufacturing		
Bata Shoe Co.	350	49

Source: ADMARC, Annual Report, 1981.

Table 3.2.1 Tobacco Auction Sales 1969-1981

Year	Total Sales[1]		Quantities of		
	Quantity ('000 kg)	Value (K'000)	Fire-cured ('000 kg)	Flue-cured ('000 kg)	Burley ('000 kg)
1969	13,082	9,186	5,878	2,771	3,462
1970	22,176	14,394	9,985	4,676	5,674
1971	26,26[illegible]	19,953	11,906	6,409	5,669
1972	30,669	20,905	13,461	8,649	5,634
1973	31,289	26,294	12,899	9,990	6,045
1974	26,836	31,739	9,232	10,522	5,372
1975	34,717	44,293	10,132	14,899	7,997
1976	36,712	55,388	12,149	16,170	6,598
1977	51,272	89,244	18,596	19,584	10,044
1978	51,061	67,528	16,402	20,850	10,584
1979	53,980	69,848	12,287	25,155	14,911
1980	54,411	59,205	9,937	26,301	16,686
1981	50,672	99,278	10,825	19,714	18,804

Source: Monthly Digest of Statistics.

[1] Includes sun/air cured tobacco.

Table 3.2.2 Principal Crops: Hectarage under Cultivation on Customary Land by Region, 1968/69[1]

Type of Crop	All Regions		Northern Region		Central Region		Southern Region	
	'000	%	'000	%	'000	%	'000	%
Total cultivated hectarage	1361.4	100.0	166.9	100.0	609.1	100.0	585.5	100.0
Maize	1068.1	78.5	110.2	66.0	463.2	76.0	494.7	84.5
Groundnuts	449.2	33.0	35.8	21.4	216.4	35.5	197.1	33.7
Pulses	841.2	61.8	71.7	43.0	352.8	57.9	416.7	71.2
Cassava	298.6	21.9	37.3	22.3	89.5	14.7	171.8	29.3
Millet and sorghum	496.2	36.4	29.9	17.9	177.1	29.1	289.2	49.4
Potatoes	180.5	13.3	8.0	4.8	93.9	15.4	78.6	13.4
Rice	48.2	3.5	7.6	4.6	1.9	0.3	38.8	6.6
Cotton	36.8	2.7	0.5	0.3	4.9	0.8	31.4	5.4
Tobacco	34.7	2.5	0.7	0.4	28.4	4.7	5.6	1.0

Note: Hectarages under mixed stands included for each crop in the mixture but only once in the total. Total includes hectarages under other crops.

Source: National Sample Survey of Agriculture 1968/69 and Statistical Yearbook.

[1]Data for 1978/79 will shortly be available.

Table 3.2.3 Volume of ADMARC Purchases, by Commodity, 1972-81

('000 tons)	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981
Tobacco	17.7	15.0	11.6	12.2	14.5	23.2	23.7	19.5	11.3	12.8
Cotton	22.1	16.2	21.4	17.8	18.0	22.6	24.2	22.4	23.1	21.7
Maize	63.6	63.1	65.5	29.2	64.8	89.9	120.6	82.2	91.9	136.6
Rice	19.9	17.3	20.9	14.7	24.5	23.9	30.8	20.5	17.5	14.7
Groundnuts	39.3	30.0	28.8	32.8	32.6	18.5	11.1	24.3	31.4	19.5
Pulses	16.0	6.8	7.9	5.9	18.6	8.8	10.4	6.7	10.6	7.2
(Index 1972=100)										
Tobacco	100	85.0	65.5	69.3	82.0	131.1	134.3	110.6	64.2	72.2
Cotton	100	73.4	96.9	80.5	81.3	102.5	109.6	101.4	104.6	98.4
Maize	100	99.2	103.0	46.0	102.0	141.4	189.7	129.3	144.5	214.9
Rice	100	86.7	104.8	73.5	123.0	119.9	154.6	102.7	87.8	73.6
Groundnuts	100	76.3	73.3	83.5	82.9	47.1	28.3	61.9	80.0	49.6
Pulses	100	42.6	49.5	37.0	116.1	54.7	65.1	41.9	66.1	45.0

(Source: Monthly Statistical Bulletin)

Table 3.2.4 Sugar: Area, Output and Exports

Year	Hectares	Output (tonnes)	Exports[3] (tonnes)	(K'000)
1969/70	2,246	26,889	1,545	158
1970/1	2,478	32,763	3,130	314
1971/2	2,593	32,423	3,637	360
1972/3	3,033	33,764	18,002	3,276
1973/4	4,500	48,962	23,142	9,180
1974/5	5,368	49,346	31,678	12,286
1975/6	6,728	64,881	42,237	23,203
1976/7	8,682	84,193	57,634	14,928
1977/8	9,095	91,541	47,907	12,207
1978/9	8,998	93,476	56,605	16,118
1979/80	-	107,629[1]	86,208	36,291
1980/1	13,850	147,423[2]	-	-
1981/2	-	166,385	-	-

1 Dwangwa hectarage not included, as still under development.

2 Includes Dwangwa hectarage and output.

3 Export figures relate to calendar year.

Source: Statistical Yearbook, 1980, and Monthly Digest of Statistics, February, 1982.

Table 3.2.5 Seed Cotton: Number of Growers and Sales to ADMARC 1965-77

Year	No. of growers	Hectarage	Purchases by ADMARC (short tons)	(mn.kwacha)
1965	54,433	40,941	22,682	2.23
1966	68,572	52,653	14,601	1.26
1967	72,700	56,459	13,050	1.07
1968	56,505	45,319	12,796	1.12
1969	45,913	37,228	20,203	1.79
1970	55,877	48,237	25,154	2.26
1971	60,582	52,837	24,610	2.62
1972	62,211	49,640	24,060	1.96
1973	61,346	53,149	17,863	1.94
1974	58,587	54,396	23,679	3.41
1975	56,596	38,156	19,632	2.90
1976	50,071	40,284	19,734	3.01
1977	57,678	37,615	24,867	4.26

Source: NSO Compendium of Agricultural Statistics, 1977.

Table 3.2.6 Computation of Export Parity Prices[1] for Rice at Selected Local Markets, 1977[2] (K/short tons)

	Karonga	Chitipa	Salima
Price, Thai milled (20% broken) f.o.b Bangkok	162.08	162.08	162.08
Add, Expenses from Bangkok to f.o.b Dar-es-Salaam	55.60	55.60	55.60
Price, Thai, milled (20% broken) c.i.f Dar-es-Salaam	217.68	217.68	217.68
Add, Railage Dar-es-Salaam to Zambia			
Price, Malawi rice equivalent in value	260.21	260.21	260.21
Less, Transport from Malawi to Zambia	67.50	67.50	67.50
Price, Malawi rice, f.o.r Limbe	192.71	192.71	192.71
Price, f.o.b mills (paddy equivalent)[3]	129.12	129.12	129.12
Less, Buying and direct expenses	57.78	57.78	57.78
Administrative and overheads	10.82	10.82	10.82
Transport from markets to mill	69.60	75.70	19.40
Export parity price at local market (K/short ton)	9.08	15.18	41.12
Export parity price at local market (t/lb)	0.50	0.75	2.06
ADMARC purchase price (t/lb)	4.50	4.50	4.50

1/ Assumes export to Zambia

2/ 1977 current prices

3/ Blantyre mill

Source: IBRD, Malawi: The Development of the Agricultural Sector, 1981 (from MANR Crop Marketing and Price Projections, 1978, and ADMARC Schedules of Road Rates).

Table 3.3.1 Numbers of Livestock in Malawi, 1969-79

Year	Cattle				Goats	Sheep	Pigs
	Northern	Central	Southern	Total			
1969	157,428	239,766	94,265	491,459	599,393	81,136	149,772
1970	163,899	229,291	98,327	491,517	639,079	73,210	146,344
1971	165,577	257,398	117,890	540,865	629,901	79,519	172,441
1972	173,301	270,333	129,271	572,905	565,580	88,516	172,333
1973	175,576	300,113	150,298	625,987	677,089	79,202	174,488
1974	189,285	308,107	151,141	648,533	693,334	79,185	154,620
1975	214,411	325,679	160,381	700,471	739,088	87,821	189,072
1976	205,792	342,350	170,412	718,554	834,586	85,194	178,939
1977	212,029	361,984	170,061	744,074	794,438	86,368	205,183
1978	217,586	370,657	201,290	789,533	655,084	78,747	174,316
1979	212,603	368,933	207,993	789,529	650,203	88,929	197,312
Proportion of total, 1969	32	49	19	100	-	-	-
Proportion of total, 1979	27	47	26	100	-	-	-
Percentage increase 1969-1979	35.0	53.9	120.6	60.7	8.5	9.6	31.7
Compound annual growth rate	3.1	4.4	8.2	4.9	0.8	0.9	2.8
No. of livestock per head of population, 1977	0.33	0.17	0.06	0.13	0.14	0.01	
					0.16		

Source: Statistical Yearbook, 1980.

Table 3.4.1 Fish Production, Beach Price, Exports and Imports, 1971-1981

	Total Malawi Waters		Production by Source ('000 Tonnes)					Exports	Imports
	Production ('000 Tonnes)	Value (K'000)	Lake Malawi	Lake Malombe(1)	Lake Chirwa(1)	Lake Chiuta(2)	Middle Lower Shire(2)	Value (K'000)	Value (K'000)
1971	73.2	5,166.0	54.0	5.0	3.6	0.9	9.7	350.7	182.0
1972	84.1	7,044.0	57.0	3.1	5.3	1.4	17.3	467.9	210.5
1973	69.4	6,114.0	54.8	2.1	1.9	0.8	9.8	538.6	156.6
1974	70.1	6,198.0	52.2	4.2	3.1	0.9	9.7	654.1	462.6
1975	70.9	7,940.8	47.2	8.1	2.8	0.7	12.1	1,357.0	260.0
1976	74.9	7,490.0	36.5	6.1	21.2	1.8	9.3	698.6	336.2
1977	68.2	6,820.0	33.9	6.4	20.8	1.5	5.6	1,046.0	217.6
1978	67.8	8,798.0	33.6	6.1	17.8	1.7	8.6+	765.8	166.3
1979	59.8	8,372.0	22.4	3.6	25.8	1.6	6.4	839.1	250.0
1980	60.8	10,521.1	30.2	6.5	19.4	0.8	3.9	1,720.0	288.0
1981	(51.3*)	(8,220.6*)	25.3	8.5	8.6	0.9	4.0	1,590.5	384.8(3)
Average Production 1979-81		Total 56.0	26.0	6.2	17.9	1.1	4.8		
Percentage		100.0	45.5	11.1	32.0	2.0	8.6		

(1) Including Upper Shire (between Lakes Malawi and Malombe).

(2) While previously landings from Lake Chiuta, Middle and Lower Shire were recorded under "OTHER WATERS" they have now been separated beginning from 1969 to show their separate water of origin by quantity.

(3) Imports: For the first threequarters of the year.

SOURCE: Department of Fisheries

* Revised figures

Table 3.4.2 Fish Output by Commercial (Modern) Enterprises, 1975-80

	1975	1976	1977	1978	1979	1980
Commercial Enterprises	8,698	7,437	6,510	6,814	7,002	6,781
Fisheries Department	231	88	151	241	360	427
Total, Commercial	8,929	7,525	6,661	7,055	7,362	7,208

Source: Department of Fisheries

Table 3.5.1 Man-Made Forests in Malawi as at 17th March, 1982

	STATUS	AREA
A.	Central Government Plantations	
	Timber Plantations	18,414.69 ha
	Wood Energy Project	1,950.00 ha
	Hardwoods	1,440.48 ha
	Viphya Pulpwood Project	53,100.00 ha
		74,905.17 ha
B.	Local Authority Forests (only Lilongwe and Dowa)	756.78 ha
C.	Rural Woodlots (including other smaller LAFs)	2,023.47 ha
D.	Private Forests	
	F.F.C.T.A.	2,832.86 ha
	I.I.C.	4,249.29 ha
	Tea Estates (Mulanje and Thyolo)	2,023.47 ha
	Chombe Tea Estates	263.05 ha
	Press	2,832.86 ha
		12,201.53 ha
	Total, private forest	89,886.95 ha
E.	Legally constituted (Reserved land)	763,470 ha
F.	Unreserved woodland	3,097,000 ha
	Overall Grand Total	3,950,356 ha

Source: Ministry of Natural Resources, Forestry Division

Table 3.5.2 Composition of Forest Plantations in Malawi

	(a)			(b)		
	(ha)	(%)		(ha)	(%)	
Coniferous plantations for sawn timber	14,950	20.6	88.0	13,103	18.4	92.0
Coniferous plantations for pulpwood	48,846	67.3		52,317	73.6	
Hardwood plantations for fuelwood and poles	7,081	9.8		3,909	5.5	
Experimental plantations	1,638	2.3		1,753	2.5	
TOTAL	72,515	100		71,082	100	

Source: (a) Background to Forestry in Malawi, Ministry of Natural Resources 1980, data for 1979.

(b) Wood Fuel in Malawi, Paper for the Energy Symposium, Zimbabwe, 14-15 October, 1980, Ministry of Natural Resources, Wood Energy Project 1980.

Table 3.5.3 Composition of the Viphya Forest Plantation 1980

Species	Northern Viphya (ha)	Luwawa (ha)	Total (ha)	(%)
Pine	42,250	8,983	51,233	94.3
Eucalyptus	1,985	30	2,015	3.7
Cupressus and other hardwood	794	283	1,077	2.0
All Species	45,029	9,296	54,325	100

Source: ODA, Viphya Utilization Study, 1980.

Table 3.6.1 Consumption of Energy in Malawi, 1979

	Quantity consumed ('000 litres)	Equivalent in tons	Energy value (megajouls)	Percentage of energy value
Petroleum products				
Petrol	57,411	43,058	2,019,420	1.5
Kerosene	9,816	7,754	360,561	0.3
Diesel	88,080	73,987	3,373,488	2.6
Total	155,307	124,799	5,753,488	4.4
Other sources				
Coal (tons)	34,146	34,146	1,024,380	0.8
Electricity (MWH)	303.6	-	1,092,960	0.8
Wood (mn. m^3)	9.7	-	123,675,000	94.0
			131,545,820	100

Sources: IBRD, Energy Sector Desk Study, 1980.

1/ Data for petroleum products from Monthly Statistical Bulletin.

2/ Electricity data from ESCOM.

3/ Estimate of fuelwood consumption by Wood Energy Project.

Table 3.6.2 Electricity: Installed Capacity and Electrical Energy Generated, 1965-79

Year	ESCOM[1]				LICENSED PRIVATE PLANT[2]		
	Installed Capacity (megawatts)			Electrical Energy Generated[3] (Millions of k.w. hours)	Installed Capacity (megawatts)		
	Hydro	Thermal	Total		Hydro	Thermal	Total
1965	0.6	13.7	14.3	52.2	1.00	5.07	6.07
1966	16.6	13.6	30.2	68.7	1.00	7.33	8.33
1967	24.6	13.6	38.2	85.2	1.06	7.41	8.47
1968	24.6	14.1	38.7	102.4	1.06	8.74	9.80
1969	24.6	14.1	38.7	116.1	1.06	8.79	9.85
1970	24.6	14.1	38.7	133.0	1.06	8.97	10.03
1971	24.6	14.8	39.4	144.9	1.06	9.17	10.23
1972	24.6	16.8	41.4	175.2	1.06	12.93	13.99
1973	40.6	16.9	57.5	195.3	1.06	13.15	14.21
1974	40.6	16.9	57.5	213.3	1.06	13.15	14.21
1975	40.6	31.9[4]	72.5	264.7	1.06	13.47	14.53
1976	54.6	31.9[4]	86.5	282.7	1.06	14.48	15.54
1977	54.6	30.8[4]	85.4	296.9	1.09	21,40	22.49
1978	64.6	22.2	87.0	311.4	1.24	7.65	8.89
1979	64.6	22.9	87.5	358.3	1.35	6.90	8.25

1/ i.e. Electricity Commission of Malawi.
2/ In terms of the Electricity Act.
3/ Electrical energy generated by ESCOM accounts for at least 90% of total energy generated.
4/ Excluding 0.295 Megawatts-thermal for Kasungu owned by Malawi Government but operated by ESCOM on an agency basis.

Source: NSO. Malawi Statistical Yearbook 1978, March 1979, p.115 and Official Sources.

Table 3.6.3 Current and Projected Energy Sales (GWH) by the Electricity Supply Commission of Malawi

SOUTHERN REGION	1981	1984	1986	1990
Domestic	30.1	32.9	34.9	
High Density	7.5	8.9	10.0	
General	28.0	35.3	41.1	
Small Power	65.1	76.4	85.2	
Large Power	11.4	12.8	13.8	
Export	1.6	1.7	1.8	
SUB-TOTAL	143.7	168.0	186.8	235.8
Portland Cement (BT)	3.6	4.6	4.7	
Changaluwe	7.7	9.0	9.2	
Walkers Ferry (BWB)	27.8	34.0	38.2	
Chileka Pumps (BWB)	18.8	22.4	25.2	
David Whitehead	24.1	40.0	40.0	
SUB-TOTAL	82.0	110.0	117.3	142.6
SUCOMA	48.7	55.0	55.0	55.0
SOUTHERN AREA TOTAL	274.4	333.0	359.1	433.4
LILONGWE				
Domestic	15.0	22.1	26.7	
High Density	2.6	4.2	5.5	
General	9.0	11.9	14.3	
Small Power	23.2	30.9	37.4	
SUB-TOTAL	49.8	69.1	83.9	125.1
Limbe Leaf (LL)	2.0	2.1	2.2	
Standard Tobacco	2.6	2.8	2.9	
Kamuzu Airport		8.0	8.2	
SUB-TOTAL	4.6	12.9	13.3	13.8
LILONGWE AREA TOTAL	54.4	82.0	97.2	138.9

Table 3.6.3 (contd.)

	1981	1984	1986	1990
Mangochi	3.2	4.8	5.1	6.8
Balaka/Liwonde)				
Ntcheu/Dedza)	3.2	4.2	5.1	7.5
SUB-TOTAL	6.4	9.0	10.2	14.3
Salima	3.3	4.7	5.7	7.5
Nkhota Kota		0.2	0.4	0.6
Kasungu		1.0	1.1	1.4
Mtunthama		2.8	3.2	3.4
Cement Works		2.0	17.0	18.2
SUB-TOTAL		6.0	21.7	23.6
Dwangwa (Sugar)		4.4	4.5	4.6
Ethanol		4.4	4.5	4.6
SUB-TOTAL		8.8	9.0	9.2
Tea Estates		4.0	4.9	5.3
Nkhata Bay		0.1	0.4	0.5
Viphya Saw Mill		5.0	35.0	35.0
SUB-TOTAL		9.1	40.3	40.8
Mzuzu		5.2	6.2	8.3
Rumphi		0.1	0.4	0.6
Ekwendeni		0.1	0.4	0.6
SUB-TOTAL		5.4	7.0	9.5
TOTAL	338.5	458.0	550.2	677.2
Wood Pulp		5.0	170.0	170.0
Fertiliser Plant		5.0	409.0	409.0
INTERCONNECTED TOTAL	338.5	468.0	1,129.2	1,256.2

Source: ESCOM, Annual Reports.

Table 4.1.1 Constraints Identified by Small-Scale Brickmakers in Malawi

Problems which the brickmakers think would hold them back from increasing production.	%	Problems given by brickmakers as existing at present.	%
Operating funds	43	Operating funds	26
Labour	11	Wood and transport	33
Clay	6	Labour	12
Water	5	Market	12
Wood	19	Clay	7
Transport	12	Water	6
Lack of market	5	No problems	4
	100		100

Source: Buchanan, loc. cit.

Table 4.2.1 The Composition of the Textile Sector in Malawi, 1977

Industry	No. of establishments	Total output value[1] ('000 MK) (% of total output)	Share of total manufacturing sector output[3] (%)	Import component '000 MK(cif) (% share of output)	Export output '000 MK(fob) (% share of total output)	Import component share of total imports %	Export component share of total exports %	Employment
1. Cotton fabrics production Spinning Output	1	15,400 (67) 404	(16)	none	2,111 (14) 404			3,000
2. Knitted fabrics production	2	434 (2)		282 (52)	51 (10)			152
3. Garment manufacture	15	4,766 (21)	(5)	3,908 (82)	500 (10)			1,700
4. Towels, Towelling manufacture	1	226 (1)		170 (75)	12 (5)			56
5. Netmaking, Twining	1	388 (2)		280 (72)	110 (28)			111
6. Blanket manufacture	2	1,700 (7)	(2)	1,063 (63)	-			417
Subtotal Industrial Textile Sector Output	22	23,419(100)	(24)	5,703 (24)	3,188 (14)	3.1	1.7	5,436
7. Small-scale traditional apparel manufacture[2]								
7.1 Local cotton input for garment manufacture		5,500		1,400 (19)				
7.2 Synthetic garment manufacturing output				1,500 (75)				

Table 4.2.1 (continued)

Subtotal traditional sector output[2]		18,400		(2,900 (30))			25 - 30,000	
Grand total textile sector output (net of local intermediate cotton input)		36,319	(37)	8,755 (27)	2,858 (8)	3.1	1.7	30-35,000
7. Total clothing apparel and ready-made textile imports for end use '000 MK cif		12,236				6.6		
8. Per caput expenditure on apparel textiles and other end use textile articles (MK p.a.)		7.6						
9. Share of total monetary consumption (%)		13						
10. Share of GDP per caput (%)		5						

Source: GOPA Textile Sector Study

1. Values = ex factory, c.i.f., f.o.b.
2. GOPA mission estimates
3. Total manufacturing sector output at current market prices is estimated at MK 97 million.

Table 4.2.2 Domestic Output of the Formal Textile Sector and End Use Demand 1971 and 1977

	Industry \ value p.a.(K'000)	1971	1977
Cotton fabrics production	End use output of domestic production	4,914	15,424
	Imports	1,409	1,754
	Exports	4	2,515
	Local end use demand	6,319	14,663
Knit wear manufacture	End use output of domestic production	681	531
	Imports	401	629
	Exports	33	51
	Local end use demand	1,049	1,109
Blanket production	End use output of domestic production	1,575	1,700
	Imports	12	23
	Exports	65	-
	Local end use demand	1,550	1,723
Synthetic fabric imports	Local production	non existent	
	Imports	723	1,939
	Local demand	723	1,939
Towels, towelling manufacture	Local end use production	-	-
	Imports	30	143
	Exports	-	12
	Local end use production	30	357
Miscellaneous textile products	Local end use production	-	388
	Imports	1,917	4,689
	Exports	-	110
	Local end use demand	1,917	4,967
	Subtotal without garment	11,560	24,758
Garment apparel industry	Local end use production	-	4,766
	Imports finished goods	1,776	2,582
	Imports second hand garments	211	477
	Exports	32	500
	Local end use demand	1,905	7,325
	Total, end use output of domestic production	7,170	23,035
	Total, domestic end use demand	13,465	32,083

Source: GOPA Textile Sector Report

Table 4.2.3 Demand Projection for Textile Goods in Malawi, 1977-85 ('000 sq. yrds., '000 MK)

Product group \ Year		1977	1978	1979	1980	1981	1982	1983	1984	1985
Home-made cotton fabrics (sq. yrds.)	high	26,000	27,821	29,685	31,702	33,964	36,408	39,128	42,123	45,424
	low	26,000	27,325	28,719	30,184	31,724	33,342	35,043	36,831	38,710
High value cotton cloth (imported) (sq. yrds.)		representing actual: mean value 70 - 77 4,700	4,982	5,281	5,598	5,934	6,290	6,667	7,067	7,491
Fabrics of or blended with man-made fibres (sq. yrds.)	high	representing actual: mean value 75 - 77 5,300	6,454	7,026	7,666	8,374	9,131	9,990	10,917	11,944
	low	5,300	5,777	6,297	6,864	7,482	8,155	8,890	9,960	10,562
Total fibre demand (sq. yrds.)	high	representing actual: about 36,000	39,257	41,992	44,966	48,272	51,829	55,785	60,107	64,859
	low		38,084	40,297	42,646	45,140	47,787	50,600	53,588	56,763
Population in 1,000		5,500	5,643	5,790	5,940	6,094	6,253	6,416	6,582	6,760
sq. yrds. per caput	high	6.5	6.9	7.2	7.5	7.9	8.2	8.7	9.1	9.6
	low		6.7	7.0	7.2	7.4	7.6	7.9	8.1	8.4
kg. per caput (equivalent+)	high	1.3	1.4	1.4	1.5	1.6	1.6	1.7	1.8	1.9
	low		1.3	1.4	1.4	1.5	1.5	1.6	1.6	1.7
Garment, apparels, other than knitwear (MK)	high	representing actual: mean value 75 - 77 5,700	7,424	8,249	9,170	10,189	11,280	12,516	13,850	15,329
	low		6,384	7,150	8,008	8,968	10,044	11,249	12,599	14,111
Per caput expenditure in apparels, other than knitwear	high	1.1 - 1.2	1.3	1.4	1.5	1.7	1.8	1.9	2.0	2.2
	low		1.1	1.2	1.3	1.5	1.6	1.7	1.8	2.0
Knitwear (MK)		representing actual: mean value 75 - 77 920	964	1,010	1,058	1,109	1,162	1,218	1,276	1,337

Source: GOPA Study, 1978.

+) Conversion factor: 1 sq. yd. = 0.2 kg.

Table 4.2.4 Output of Agricultural Implements by AGRIMAL (Malawi) Ltd., 1974-81

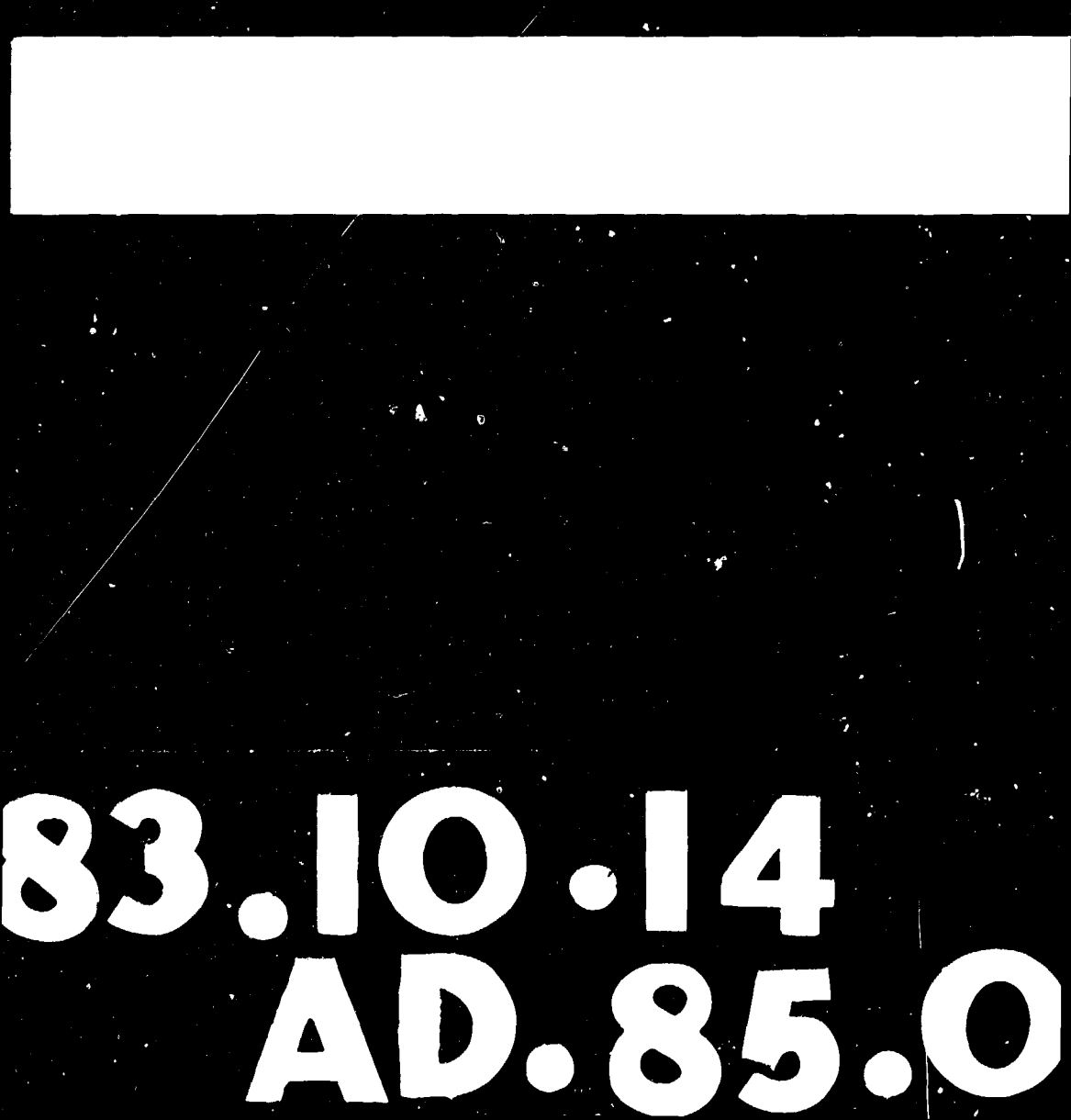
Description of Goods	1974	1975	1976	1977	1978	1979	1980	1981	TOTAL
Hoes: 1½ lb (Bundles of 10 hoes)	-	583	-	608	-	163	-	-	1,354
2 lb "	-	1,504	1,587	-	-	3,273	8,114	-	14,478
2½ lb "	78,917	70,178	38,633	65,286	74,983	41,317	39,463	54,383	463,160
TOTAL HOES	78,917	72,265	40,220	65,894	74,983	44,753	47,577	54,383	478,992
Implements (single units) 8" ploughs	1,100	2,261	2,891	1,714	2,812	2,963	1,654	586	15,981
8" Upset share ploughs	200	-	-	-	-	25	-	-	225
10" Flat share ploughs	-	-	-	50	695	1,400	135	-	2,280
10" Upset share ploughs	-	-	-	-	-	-	-	-	-
High wing ridging plough	1,281	1,057	293	1,031	1,549	2,540	1,130	301	9,182
Harrows:									
Triangular	-	-	56	-	1	-	1	-	58
Diamond - Outer	-	-	-	-	-	12	-	-	12
Diamond - Inner	-	-	-	-	-	13	-	-	13
Zig Zag - Medium	644	227	-	-	-	-	-	-	871
Zig Zag - Heavy	246	227	400	-	-	104	135	-	1,112
Planter - single row with fert.	381	-	-	6	1	1	26	5	420
Cultivators:									
S51 Standard	-	-	-	180	5	377	26	-	588
S51 Light	-	190	75	-	3	50	50	-	368
MC5	-	-	145	-	1	12	100	-	258
Rice Threshing M/C	-	-	-	-	3	-	-	-	3
TOTAL IMPLEMENTS	3,852	3,962	3,860	2,981	5,070	7,497	3,257	892	31,371

Source: AGRIMAL.

Table 4.2.5 Ox and Tractor Cultivation in Malawi

District	Tilled by oxen		Tilled by tractor	
	% of plots	% of area	% of plots	% of area
Shire Valley	0.6	0.9	0.9	0.7
Lilongwe	0.5	0.8	0.0	0.0
Thiwi/Lifadzi	2.0	2.6	0.0	0.0
Karonga	44.0	59.7	0.0	0.0
Chitipa	2.5	3.6	0.0	0.0
Rukuru/Upper Kasitu	20.6	22.8	0.0	0.0
Henga/Lower Kasitu	5.8	9.6	0.0	0.0

Source: F.A.O. Programme Development Mission, Rome, 1981, p. 245.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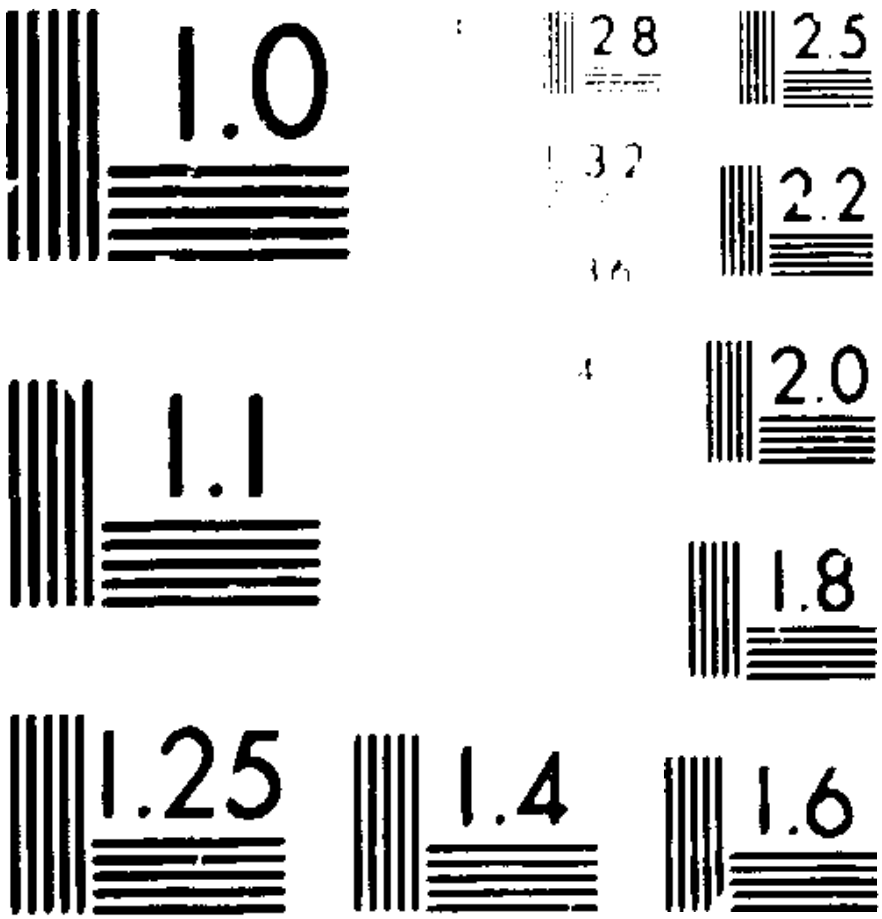

Table 4.3.1 Forecast of demand for leather in Malawi[1] and its equivalent in hides and skins

	1980	1985	1990
Shoes[2]			
plain upper leather (ft^2)	400,000	870,000	2,000,000
suede grain splits (ft^2)	84,000	235,000	500,000
lining leather (ft^2)	30,000	70,000	160,000
totals (ft^2)	514,000	1,175,000	2,660,000
equivalent numbers of hides[3]	17,133	39,167	88,667
Travelgoods			
bovine leather (ft^2)	50,000	115,000	265,000
goat leather (ft^2)	50,000	115,000	265,000
totals (ft^2)	100,000	230,000	530,000
equivalent number of:			
hides[3]	1,667	3,833	8,833
goat skins[4]	8,333	19,167	44,167
Curios and souvenirs			
bovine leather (ft^2)	30,000	85,000	170,000
goat leather (ft^2)	30,000	85,000	170,000
totals (ft^2)	60,000	170,000	340,000
equivalent number of:			
hides[3]	1,000	2,833	5,667
goat skins[4]	5,000	14,167	28,333
Hides and skins			
total number of hides	19,800	45,833	103,167
total number of skins	13,333	33,334	72,500

1) excludes flesh splits.
2) based on a continuation of the 18% annual growth rate assumed by the BATA shoe factory for its production planning through 1983.
3) at an average conversion factor of 30 square feet per hide.
4) at an average conversion factor of 6 square feet per skin.

Source: GOPA - feasibility study, page 60. IBRD Mission estimates.

Table 4.4.1 Output and Sales of the Salima Fish Cannery 1974/5 to 1981/2

	Total production (kg)	Quantity exported (kg)	Quantity sold to Malawi Army and Police (kg)	Total quantity sold[1] (kg)	Total value of sales (kwache)
1974/5[2]	39,118	35,306	-	35,601	35,221
1975/6	91,893	35,649	275	42,771	38,217
1976/7	39,254	48,059	331	49,264	29,946
1977/8	31,219	40,064	4,140	49,129	57,549
1978/9	17,872	20,038	12,144	38,907	52,354
1979/80	26,740	-	30,139	33,141	59,679
1980/1	29,408	-	24,341	29,368	58,294
1981/2[2]	12,421	-	9,241	9,345	20,154

Source: Salima Canners.

[1]Sales lag behind production. [2]Six months.

Table 4.5.1 Estimated Production and Consumption of Sawnwood in Malawi, 1968-79

m^3

	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
SOFTWOOD												
Local production												
Zomba Sawmill	3,603	4,440	3,174	4,687	5,434	6,636	6,169	6,316	6,309	7,599	8,419	8,507
Dedza Sawmill	2,561	3,336	3,359	2,739	3,878	4,991	6,076	6,241	6,124	3,500	5,617	8,339
Blantyre Sawmill[a]	1,941	4,222	4,753	4,091	4,912	5,327	5,487	6,642	5,034	5,564	7,515	7,241
Chikangawa Sawmill	1,000	1,354	1,366	1,948	1,933	932	-	-	-	-	-	-
Total Government Sawmills	9,105	13,352	12,652	13,464	16,157	17,886	17,732	19,199	17,467	16,663	21,551	24,087
Imported[b]	7,949	8,263	6,983	5,909	7,649	5,821	7,357	8,421	5,182	2,906	2,788	3,810
Total Softwood	17,054	21,615	19,635	17,373	23,806	23,607	25,089	27,620	22,649	19,569	24,339	27,897
HARDWOOD												
Local production												
Imperial Group Sawmill[c]	9,572	6,261	12,408	16,261	14,830	14,901	14,436	14,488	14,762	16,733	16,601	17,382
Other sawmills (estimated)[c]	567	708	991	890	1,190	1,100	1,100	1,100	1,100	1,100	1,100	1,100
Pitsawn (estimated)	3,000	3,000	3,000	3,000	3,500	3,500	3,500	3,500	4,000	4,000	4,000	4,000
Imported sleepers	1,201	3,731	1,773	1,643	732	2,130	2,018	3,195	478	-	8	1,779
Total hardwood	14,342	13,700	18,172	21,794	20,252	21,631	21,054	22,283	20,340	21,833	21,709	24,261
Total hardwood and softwood	31,394	35,315	37,807	41,167	44,058	45,338	46,143	49,903	42,989	41,402	46,048	52,158

Source: Department of Forestry, MANR.

Notes: (a) Blantyre sawmill produces some hardwoods which are included.
(b) Assumed no hardwoods are imported.
(c) Small quantities of softwoods are sawn.

Table 4.5.2 Estimated Future Sawn Timber Demand in Malawi by End-Use

	Construction[b]	Agricultural and other Packaging[c]	Furniture and Joinery[d]	Railway Sleepers[e]	Total
1979[a]	25,500	20,500	4,400	1,000	51,400
1980	26,163	21,218	4,690	1,000	53,071
1985	29,746	25,200	6,456	1,000	62,402
1990	33,819	29,929	8,888	1,000	73,636
1995	38,450	35,547	12,234	1,000	87,231
2000	43,715	42,218	16,840	1,000	103,773

Source: IBRD, Agro-Processing Report.

Notes: (a) 1979 figures are rounded totals.

(b) Assumed growth rate of 2.6% p.a., based on trend since 1968.

(c) Assumed growth rate of 3.5% which is below historical trend because of reduction in agricultural output and substitution of alternative packaging materials.

(d) Assumed growth of 6.6% p.a. based on historical trend.

(e) Stable consumption based on replacement demand only.

Table 4.6.1 Manufacturing and Other Small-Scale Enterprises in Malawi, 1977-78

	Blantyre/ Limbe	Lilongwe	Liwonde	Mzuzu	Karonga	Lunzu/ Lirangwe	LLDP	Thekerani	Mkhota	Rural Areas*				Country Total
										Grade A	Grade B	Grade C	Grade D	
Identified SSE Units	79	36	3	5	4	3	10	6	1					
Identified Self-employed	506	368	40	17	31	70	290	27	5					
Coverage factor (%)	70	80	90	60	90	70	90	90	90					
Total SSE Units	113	45	4	8	5	5	11	7	1	48	90	400	140	877
Total Self-employed	722	460	44	28	34	100	322	30	6	528	1800	2720	840	7634
Contractors														80
Brickmakers (Commercial)														500
Transporters														1000
Handicrafts														1400

TOTAL SSI SECTOR IN MALAWI : 11.491

Source: Small-Scale Industries Unit, Ministry of Trade, Industry and Tourism.

* Rural Areas: Grade A includes the following towns: Zomba, Mangochi, Liwonde, Balaka, Dedza, Salima, Mzuzu and also Ngabu, Chitakali, Likhubula, Chiromo, Thyolo, Luchenza, Nambuma (compared with Liwonde).

Grade B includes Lunzu, Ntaja, Chonde, Migowi, Thuchila, Nsanje, Pumula, Songani, Thete, Mponela, Namitete, Nathenje, Nkhoma, Nsaru, Tembwe, Ntcheu, Nkhota-kota, Ntchisi, Mzimba (compared with Lunzu).

Grade C includes 80 centres that have been compared with Karonga.

Grade D includes 140 centres that have been compared with Mkhota.

Table 4.6.2 Malawian-Owned Small-Scale Enterprises in Blantyre-Limbe, Lilongwe, and Liwonde, 1978, by type of activity

Activity	Blantyre-Limbe			Lilongwe			Liwonde			Total		
	No. of units	No. of self-employed	Total, all enterprises	No. of units	No. of self-employed	Total, all enterprises	No. of units	No. of self-employed	Total, all enterprises	No. of units	No. of self-employed	Total, all enterprises
Manufacturing	76	366	442	36	264	300	2	12	14	114	642	756
Tailoring	11	361	372	3	220	223	-	11	11	14	592	606
Tinsmithing	33	-	33	5	9	14	-	-	-	38	9	47
Carpentry	16	5	21	12	35	47	2	1	3	30	41	71
Maize milling	7	-	7	10	-	10	-	-	-	17	-	17
Other	9	-	9	6	-	6	-	-	-	15	-	15
Repair Services	47	119	166	14	70	84	1	8	9	62	197	259

Source: Ministry of Trade, Tourism and Industry, 1978.

Table 4.6.3 Selected Statistics for Malawian Small-Scale Brickmaking, 1978

Estimated number of brickmakers			400
Total number of persons engaged			15,240
of which:	men	5,840	
	women	4,000	
	young people	5,400	
Total number of bricks made (million)			53.7
Total amount of firewood used ('000 stacked cu. yards)			56.6
Average duration of brickmaking season (months)			4.36
Average distance from which firewood transported (miles)			11.73
Method of transporting firewood (% of total):			
- by lorry			66.5
- by ox cart			22.0
- by hand			11.5

Source: W. Buchanan, Development of Brickmaking Industry and Inventory of Industrial Ceramic Raw Materials, UNIDO, DP/MLW/78/003, 1982

Table 4.6.4 The Ownership of Household Equipment Among Rural Households in Kawinga District

Item	Proportion of farm households owning	
	No. in sample	%
Bicycle	122	41
Radio	55	18
Watch	37	12
Paraffin stove	18	6
Paraffin lamp	108	36
Chair	133	45
Table	86	28
Bed	146	49

Source: Kawinga, Report No. 51, Agro Economic Survey, January, 1982.

Table 4.7.1 Ministry of Trade and Industry: Short List of Projects Selected for Consideration in 1982

1. Food/beverages (ISIC - 31)
   a) Rehabilitation/expansion of Mulanje Cannery.
   b) Rehabilitation/expansion of Salima Cannery.
   c) Edible oil industry expansion.
   d) Refrigerating and drying of fish.

2. Textile/apparel (ISIC - 32)
   a) Projects package of David Whitehead's
      i) Polyester-cotton fabrics
      ii) Waste cotton project for coarse yarn and cotton wool
      iii) Polypropylene bags project expansion
      iv) Bandages
      v) General expansion
   b) Tanneries
      i) Small-scale plant in Northern Region
      ii) Large complex
   c) Garment import substitution

3. Wood/wood products (ISIC - 33)
   Cooperation with the Forest Industry Department on their project proposals covering a variety of areas.

4. Pulp/paper (ISIC - 34)
   Cooperation with VIPCOR.

5. Fertiliser/etc. (ISIC - 35)
   a) Fertiliser project
   b) Plastic products
   c) Soap-making in Northern Region

6. Non-metallics (ISIC - 36)
   a) Glas manufacturing project
   b) Brick making (mechanised)
   c) Lime production
   d) Cement
   e) Pottery development

7. Basic metals (ISIC - 37)
   - Foundry

8. Metal products/equipment (ISIC - 38)
   - Farm implements and agricultural tools

Table 4.7.2 Ministry of Trade and Industry, Industrial Development Programme: Group I (Potential Defined) Projects

Small-scale projects	Projects suited for foreign equity participation	Other projects
Agriculture-based	**Agriculture-based**	
Coffee processing in North(E). Jams, jellies, pickles. Grape/wine industry Bandages	Sugar refining (75-100,000 tons) (E)	Tea factories, Mulanje and Kavusi. Pineapple products and concentrates. Macadamia processing (E). Guar beans processing. Nitrogen fertiliser (E).
Livestock-based	**Livestock-based**	
Poultry	Tannery (150,000 hides and skins)	Meat products export (E)
Fisheries-based	**Fisheries-based**	
-	-	
Mineral-based	**Mineral-based**	
Brickmaking, Chadza	Salt production (15,000 tons) Cement plant (120,000 tons) Lime production (20,000 tons) Mechanised brick and tile production (21 million)	
Forest-based	**Forest-based**	
Brooms, brushes, etc. Small paper products, labels, etc. Honey and beeswax(E)	Groundwood pulp and paper plant (possibly integrated with sawmill/plymill) (12,000 tons paper, 45,000 m^3 sawn wood, 4,000 m^3 ply/block-board).	Sawmill(Zomba) Wood toys and furniture parts (E). Ceiling panels.
Energy-related	**Energy-related**	
-	Fertiliser by water electrolysis (92,000 tons ammonium nitrate). Re-fining used oil (15,000 hecto-litres).	
Other	**Other**	**Other**
Toothpaste Cutlery Padlocks, door fittings Lamps and fixtures Bicycles and parts Imitation jewellery	Insulated copper cable (1,000 tons)	Plastic hand pumps, etc. (E)

E = Export potential

Table 4.7.3 Ministry of Trade and Industry, Industrial Development Programme: Group II, Possible Projects Requiring Definition

Small-scale projects	Projects suited for foreign equity participation	Other projects
Agriculture-based	**Agriculture-based**	
Syrups and glucose Bakery industry. Soap making. Utilization of mangoes and other fruits (E). Rubber erasers Handloom weaving, tie and dye (E). Cotton wool utilization Braiding and narrow fabrics including shoe laces. Agricultural tools	Edible oil (E). Dehydration of fruit and vegetables (E) Spice growing and processing (E). Utilization of mangoes and other fruits (E). Grape/ wine industry (E). Leucaena (E). Tea seed oil (E). Ethanol from cassava (N) Garments (E) Phosphatic fertiliser Agricultural pesticides	Tung oil (E) Starch (E) Groundnut processing (E) Oyster nut (E) Rice processing (E) Cotton ginning (E)
Livestock-based	**Livestock-based**	
Exotic leather production (E). Leather products (E). Candle making, glue.	Exotic leather production (crocodiles, etc.) (E)	
Fisheries-based	**Fisheries-based**	
Fish farming (E) Fish hooks	Fish farming (E)	Lake fly utilization (E)
Mineral-based	**Mineral-based**	
Charcoal production(N) Pottery development Asbestos cement products (C). Ornamental stones. Blackboard chalk Lime-making (C) Clayroof tiles (C) Fibre-cement roofing (C). Sawdust utilization (N).	Coal mining (N) Explosives. Bauxite processing (E). Uranium utilization (N) (E) Industrial abrasives (E) Nepheline syenite utilization (C) (E). Mechanised brick and tile production, Blantyre (C)	Kyanite Vermiculite Gypsum
Forest-based	**Forest-based**	
Pencils Wood-wool cement slab (C) Wax polish, various.	Sawmill, Viphya (C). Plywood/ blockboard mill (Zomba or Viphya)(C). Fibreboard mill, Zomba (C). Pine and hardwood furniture (E). Bamboo utilization (E). Pulp for paper (E) (180,000 tons p.a.). Nitrogenous fertilizer from wood Petrol from wood (N). Chemicals from wood (E). Furfural production (E). Laminated door and window frames (C). Formaldehyde based resins for glues.	Parquet flooring (E)

Table 4.7.3 (continued)

Other Energy-related	Other Energy-related	
Paraffin substitution from local sources. Solar, biogas, wind energy development.		
Other	Other	Other
Date stamps Buttons, studs, fasteners. Umbrellas.	Steel rolling mill/wire drawing. Galvanising plant. Plastic bath tubs. Sulphuric acid production. Local dye production. Infusion solutions. Cutlery Batteries Precision metal working	

E = Export potential

N = Energy-related

C = Construction-relate

Table 5.1.1 The Distribution of Cash Income in Rural Areas of Malawi: All Districts*

Cash Income (MK)	Percentage of households	Percentage of aggregate income	Cumulative percentage of households	Cumulative percentage of aggregate income
0-	35.6	3.4	35.6	3.4
10-	16.4	5.3	52.0	8.7
20-	10.9	6.9	62.9	15.6
30-	7.0	5.0	69.9	20.7
40-	4.6	5.4	74.5	26.1
50-	4.4	7.0	78.9	33.1
60-	3.9	5.8	82.8	38.9
70-	3.0	5.1	85.7	44.0
80-	1.6	3.0	87.3	47.1
90-	1.7	4.4	88.9	51.5
100-	5.8	15.9	94.7	67.4
150-	2.4	9.3	97.1	76.7
200-	1.0	5.1	98.1	81.8
250-	0.6	3.5	98.7	85.2
300 and over	1.3	14.8	100	100

*Covers sample of districts listed in Table 5.1.2. Sample surveys carried out over a period.

Source: Raw data from Agro-economic Surveys.

Table 5.1.2 The Distribution of Cash Income in Rural Areas of Malawi: Individual Districts (cumulative percentages)

District	Cash Income	0-	10-	20-	30-	40-	50-	60-	70-	80-	90-	100-	150-	200-	250-	300 and over
Ekwendeni 1976/7	% h/h	51.9	69.2	77.4	82.0	84.2	85.7	90.2	91.0	91.7	92.5	95.5	98.5	99.2	99.2	100
	% inc	6.6	15.6	21.8	27.4	30.9	33.7	44.1	40.6	48.4	51.0	63.8	85.5	90.0	90.0	100
Central Mzimba 1977/8	% h/h	37.8	49.9	59.7	67.3	75.7	81.7	84.7	85.5	86.3	87.8	95.3	96.9	96.9	98.4	100
	% inc	2.5	6.0	12 1	18.6	27.7	35.8	40.8	42.1	43.7	47.2	68.1	74.4	74.4	85.0	100
Southwest Mzimba 1976/7	% h/h	39.2	52.1	60.7	68.5	72.1	76.4	84.2	87.1	89.2	91.3	97.8	99.2	100	100	100
	% inc	4.4	9.9	15.6	23.4	28.0	34.7	49.1	55.2	60.2	65.9	88.5	95.4	100	100	100
Kasungu-North 1978/9	% h/h	22.8	40.1	53.2	63.5	71.9	77.1	79.4	85.5	86.9	89.7	94.3	96.7	98.5	99.5	100
	% inc	2.6	8.2	15.4	23.1	31.2	37.4	40.7	50.5	54.4	60.2	72.6	82.0	91.0	96.7	100
Dowa-West 1977/8	% h/h	14.6	22.9	36.8	41.0	44.5	50.1	55.7	62.0	67.6	69.7	87.2	95.6	97.7	97.7	100
	% inc	0.8	2.5	7.1	9.0	10.9	15.0	19.9	26.0	32.0	34.0	62.8	82.3	88.2	88.2	100
Nkhota-Kota 1979/80	% h/h	30.0	42.3	54.2	61.4	67.3	72.0	74.5	78.8	81.7	83.8	91.9	95.3	96.1	96.6	100
	% inc	1.7	4.2	12.1	15.8	23.1	33.8	36.1	40.6	44.1	50.5	64.3	72.2	75.1	76.8	100
Nchisi 1979/80	% h/h	13.6	34.6	49.6	59.8	64.6	72.1	74.8	78.2	80.9	83.6	90.4	93.1	93.8	97.2	100
	% inc	1.2	6.5	12.8	18.8	22.4	29.6	32.6	37.0	41.1	45.4	59.1	66.8	69.1	84.9	100
Mwanza 1976/7	% h/h	34.7	58.8	68.7	78.0	81.5	85.8	92.1	95.0	95.0	96.4	97.8	97.8	100	100	100
	% inc	5.9	18.3	26.7	37.7	43.1	51.2	65.7	73.1	73.1	77.8	83.1	83.1	100	100	100
Ntcheu-Mwanza 1977/8	% h/h	43.8	58.9	66.9	70.5	74.1	79.8	84.1	85.6	86.3	87.7	93.5	96.4	97.1	97.1	100
	% inc	3.1	6.9	9.9	12.0	14.7	20.3	25.2	27.0	28.0	31.7	43.2	51.4	53.9	53.9	100
Kawinga-South 1979/80	% h/h	55.8	72.4	81.3	85.5	88.9	91.0	93.7	95.8	95.8	96.5	99.5	99.5	100	100	100
	% inc	10.5	22.4	35.5	40.5	48.7	54.6	63.9	71.7	71.7	75.2	91.7	91.7	100	100	100
Mzimba-South 1978/9	% h/h	46.6	79.9	83.9	91.9	95.9	97.3	98.6	98.6	98.6	98.6	100	100	100	100	100
	% inc	14.6	42.7	48.9	67.1	78.5	83.3	89.4	89.4	89.4	89.4	100	100	100	100	100
Kawinga-North 1979/80	% h/h	52.0	67.8	82.1	87.6	88.3	90.4	94.5	95.8	95.8	96.5	97.9	99.3	100	100	100
	% inc	10.8	20.8	38.1	46.8	48.2	53.3	66.1	71.1	71.1	74.2	82.6	93.5	100	100	100

Source: As 5.1.1

% h/h = percentage of households % inc = percentage of aggregate cash income

DISTRICT	INCOME FROM CROPS										TOTAL CROPS	INCOME FROM LIVESTOCK			TOTAL FARM INCOME	NON FARM INCOME						TOTAL NON-FARM INCOME	TOTAL CASH INCOME
	COTTON	FRUIT & VEGETABLES	GROUNDNUTS	MAIZE	MILLET/ SORGHUM	OTHER	RICE	ROOTCROPS	SUGAR CANE	TOBACCO		POULTRY	LIVESTOCK	LIVESTOCK PRODUCTS		BEER	EMPLOYMENT	FISH	GIFTS	HANDICRAFTS	OTHER		
E. Kwendani 1976/77	-	16.3	2.3	16.1	1.8	0.1	-	0.2	-	-	36.9	1.6	9.4	2.1	50.1	-	45.9	-	2.9	-	-	49.9	100
Central Mzimba 1977/78	-	2.8	9.8	8.8	1.1	-	-	0.4	-	14.6	37.6	1.2	16.5	2.5	58.1	-	36.0	-	2.5	-	3.2	41.9	100
S.W. Mzimba 1976/77	-	8.3	3.5	9.5	5.7	0.3	-	0.2	-	17.1	45.7	3.3	11.2	0.6	60.8	-	16.3	-	3.7	0.2	18.9	39.1	100
Kasungu North 1978/79	-	3.2	10.1	4.6	0.3	1.6	-	0.8	-	21.2	42.0	3.1	3.3	2.0	50.9	12.0	21.6	-	3.5	2.1	9.6	49.1	100
Dowa West 1977/78	-	1.4	4.4	3.4	-	-	-	-	0.1	64.0	73.4	0.8	1.8	2.4	78.5	9.5	7.2	-	1.0	2.7	0.8	21.4	100
Mkhota Kota 1979/80	3.9	2.0	1.5	3.1	-	1.3	26.3	2.9	-	-	41.2	0.5	1.6	0.2	43.4	2.9	30.4	26.3	1.1	0.9	1.7	56.5	100
Nchisi 1979/80	-	5.1	5.8	3.4	-	1.0	-	-	-	38.9	54.2	5.3	4.2	3.7	67.5	11.9	12.7	0.1	6.4	0.5	1.4	32.4	100
Mwanga 1976/77	1.8	22.8	0.4	12.8	0.1	-	-	1.2	1.0	-	40.2	1.7	4.1	1.8	47.9	17.1	29.5	-	0.9	1.3	3.2	52.1	100
Ntcheu Nkhata 1977/78	49.6	5.8	0.3	0.5	-	0.1	-	-	0.5	0.1	57.0	0.3	8.7	0.7	66.8	2.4	28.3	-	0.3	0.4	1.9	33.2	100
Kasungu South 1979/80	-	1.7	3.3	6.6	-	2.6	2.2	6.8	-	-	23.3	2.1	3.5	1.6	30.6	7.4	12.3	33.5	7.4	0.1	8.5	69.3	100
Mzimba South 1978/79	-	10.4	5.8	8.6	0.5	0.8	-	0.4	-	-	26.7	5.4	14.6	2.8	49.6	6.0	17.5	-	18.8	5.7	2.1	50.3	100
Kasungu North 1979/80	-	4.2	9.4	33.2	0.4	0.2	0.8	1.3	0.7	-	50.3	3.6	3.5	0.3	57.7	0.7	19.1	9.5	4.0	2.8	5.9	42.2	100
ALL	4.6	7.0	4.7	9.2	0.8	0.7	2.4	0.7	0.2	13.0	44.0	2.4	6.8	1.7	55.2	5.8	22.2	5.7	4.3	1.6	4.8	44.8	100

SOURCE: RAW DATA FROM AGRO ECONOMIC SURVEYS

TABLE 5.1.3. SOURCES OF CASH INCOME OF SMALLHOLDER HOUSEHOLDS IN MALAWI

Table 5.1.4 Main Sources of High Cash Incomes Among High Cash Income Earners in the Rural Areas of Malawi

	No. of earners with cash income of K100 and under 200 p.a.	No. of earners with cash income of K200 or more p.a.	All high cash income earners (no. of earners)
Tobacco	40 (9)	9 (7)	49 (16)
Cotton	6 (2)	5 (1)	11 (3)
Maize	4 (10)	0 (4)	4 (14)
Rice	9 (2)	3 (0)	12 (2)
Groundnuts	3 (7)	0 (0)	3 (7)
Fruit and vegetables	1 (4)	1 (1)	2 (5)
Other crops	0 (0)	0 (1)	0 (1)
Crop farming (unspecified)	0 (3)	1 (0)	1 (3)
Total, crops	63 (37)	19 (14)	82 (51)
Livestock, especially cattle	12 (5)	3 (4)	15 (9)
Poultry	0 (2)	0 (0)	0 (2)
Livestock products	0 (5)	0 (3)	0 (8)
Total, Livestock and products	12 (12)	3 (7)	15 (19)
Fish	9 (1)	4 (0)	13 (1)
Total, Crops, livestock and fish	84 (50)	26 (21)	110 (71)
Beer	2 (8)	1 (3)	3 (11)
Handicrafts	1 (2)	0 (2)	1 (4)
Other products	2 (3)	3 (1)	5 (4)
Total, beer, handicrafts, etc.	5 (13)	4 (6)	9 (19)
Employment	22 (14)	8 (1)	30 (15)
Gifts	0 (0)	0 (1)	0 (1)
Total, all sources	111 (77)	38 (29)	149 (106)

Note: Data refers to number of times the activity represents the main source of high cash income. Figures in brackets refer to number of times the activity is a joint source with other important activities or supplementary to another more important activity.

Source: Raw data from Agro-economic surveys.

Table 5.1.5 Size Distribution of Smallholder Farms in Malawi

Size of farm plot (ha.)	Central Mzimba	Kasungu North	Dowa-west	Nkhota-kota	Nchisi	Ntcheu-Mwanza	Kawinga-south	Mzimba-south	Kawinga-north	Total, all districts
0-	-	-	-	3.6	-	1.3	5.2	-	3.4	1.5
0.2-	2.0	-	-	14.8	0.7	6.7	15.2	1.3	8.9	5.4
0.4-	4.0	1.3	0.7	30.8	3.4	12.7	30.4	8.3	16.4	12.1
0.6-	10.7	7.9	4.0	46.4	10.2	24.8	47.6	11.1	24.6	20.9
0.8-	18.7	17.3	5.4	60.4	16.4	30.2	62.9	11.1	39.0	29.0
1.0-	21.4	26.6	14.1	70.4	26.7	46.3	75.4	23.6	54.1	39.8
1.2-	33.5	37.3	19.5	82.4	41.7	58.3	85.4	31.9	68.4	50.8
1.5-	54.3	57.3	40.5	91.8	56.8	75.1	92.0	45.7	85.6	66.4
2.0-	72.4	66.6	59.4	96.6	69.8	85.2	96.6	62.4	93.8	77.9
2.5-	78.5	83.9	74.9	98.2	82.8	91.2	98.6	69.3	97.9	85.9
3.0-	89.2	87.9	81.7	98.2	92.4	93.9	100	90.2	98.6	92.2
3.5-	89.9	90.6	87.1	98.2	95.8	95.3	100	95.7	99.3	94.3
4.0-	93.9	95.9	91.8	99.4	97.9	95.9	100	97.1	99.3	96.4
4.5-	94.6	97.3	93.9	100	98.6	97.3	100	98.5	99.3	97.3
5.0-	100	100	98.6	100	100	97.9	100	100	99.3	99.0
6.0-	100	100	99.3	100	100	98.6	100	100	100	99.3
7.0 and over	100	100	100	100	100	100	100	100	100	100
Total no. of farms	149	75	148	146	146	149	151	72	146	1182

Source: As 5.1.1

Table 5.1.6 Per Capita Household Distribution of Income in Malawi, 1977

Income Group (Kwacha)	Number of Households	Mean Income (Kwacha)	Total Income Accruing to Households in Each Income Category	Cumulative % of Households	Cumulative % of Individuals	Cumulative % of Tctal Income	Average Numbers of Individuals Per Household
0-9	-	5	-	-	-	-	-
10-19	282,717	15	14,248,937	16.85	16.14	4.4469	3.36
20-29	706,223	25	61,971,068	58.93	58.26	23.7873	3.51
30-39	180,943	35	23,178,798	69.72	69.51	31.0211	3.66
40-49	298,885	45	53,530,304	87.53	89.73	47.7273	3.98
50-74	1,502	62.5	239,299	87.62	89.79	47.8019	2.39
75-99	81,695	87.5	15,440,355	92.49	92.79	52.6207	2.16
100-149	42,961	125	13,210,508	95.05	94.59	56.7435	2.46
150-199	46,153	175	35,618,578	97.80	98.04	67.8596	4.41
200-249	-	225	-	-	-	-	-
250-299	8,275	275	10,035,506	98.30	98.66	70.9916	4.41
300-349	6,672	325	2,168,400	98.69	98.78	71.6683	1.0
350-399	1,827	375	3,021,401	98.80	98.91	72.6113	4.41
400-499	-	450	-	-	-	-	-
500-599	8,156	550	12,739,672	99.29	99.31	76.5872	2.84
600-699	-	650	-	-	-	-	-
700-799	5,200	750	10,842,000	99.60	99.55	79.9708	2.78
800-899	-	850	-	-	-	-	-
900-999	-	950	-	-	-	-	-
1000-1249	2,009	1,125	6,147,540	99.72	99.65	81.8894	2.72
1250-1499	658	1,375	2,460,920	99.76	99.69	82.6574	4.41
1500-1749	758	1,625	5,432,018	99.80	99.75	84.3527	4.41

Table 5.1.6 (continued)

Income Group (Kwacha)	Number of Households	Mean Income (Kwacha)	Total Income Accruing to Households in Each Income Category	Cumulative % of Households	Cumulative % of Individuals	Cumulative % of Total Income	Average Numbers of Individuals Per Household
1750-1999	393	1,875	3,249,619	99.83	99.78	85.3668	4.41
2000-2249	541	2,125	5,069,846	99.86	99.82	86.9491	4.41
2250-2499	399	2,375	4,179,026	99.88	99.85	88.2533	4.41
2500-2999	723	2,750	8,768,183	99.93	99.91	90.9898	4.41
3000-3499	359	3,250	5,145,368	99.95	99.93	92.5956	4.41
3500-3999	440	3,750	7,276,500	99.97	99.97	94.8665	4.41
4000-4999	111	4,500	2,202,795	99.98	99.97	95.5539	4.41
5000-5999	205	5,500	4,972,275	99.992	99.990	97.1057	4.41
6000-7999	50	7,000	1,543,500	99.995	99.993	97.5874	4.41
8000-9999	-	9,000	-	-	-	-	-
10,000-19,999	74	15,000	4,895,100	99.9992	99.999	99.1151	4.41
20,000-39,999	-	30,000	-	-	-	-	-
40,000-59,999	14	45,920	2,835,101	100.00	100.00		4.41
Total (Mean)	1,678,043	(191)	320,422,616	100.00	100.00	100.00	(3.51)

Mean per capita income (cash and subsistence) before direct taxes = 57.8 Kwacha

Source: J.G. Kydd and R.E. Christiansen, The Distribution of Income in Malawi in 1977, University of Malawi, Centre for Social Research, March, 1981.

Table 5.1.7 Income Distribution Figures for Selected Countries

Country	Percentage of Population Households Receiving the Specified Percentage of Income						Gini Coefficient
	20%	40%	60%	80%	90%	95%	
Malawi (1977)	6	15	25	40	48	58	.530
U.S.A. (1972)	4	14	30	54	72	83	.417
U.K. (1968)	7	19	36	60	76	86	.339
Tanzania (1969)	2	6	16	34	51	67	.597
India (1968)	5	13	26	47	63	75	.478
Germany GDR, 1970	10	26	46	69	83	91	.204
Sri Lanka (1970)	7	18	33	55	71	81	.377

Source: Kydd and Christiansen, loc. cit.

Table 5.1.8 Numbers of Craftsmen Relative to Population, Lilongwe Land Development Project, 1978

Categories	No. of craftsmen	Estimated no. of farm families	Estimated no. of population	Farm families per craftsman	Population per craftsman
Peri-urban	64	14,436	63,518	226	992
'Rurban'	168	36,079	165,963	215	988
Rural	233	55,974	263,939	240	1,133
LLDP Total	465	106,488	493,420	229	1,061

Source: Report of the 1978 survey of rural craftsmen in the Lilongwe Land Development Programme, Ministry of Agriculture and Natural Resources, Land Allocation Section, February, 1980.

Table 5.1.9 The Changing Population/Land Balance in Malawi

		Northern Region	Central Region	Southern Region	All Malawi
Total land area ('000 ha.)		2,689	3,553	3,170	9,412
Proportion arable (%)		37	37	37	37
Potential arable land[1] ('000 ha.)		995	1,315	1,173	3,482
Population ('000)	1966	497	1,475	2,067	4,040
	1977	643	2,122	2,796	5,562
	1985(est.)[2]	322	2,712	3,574	7,109
	2005(est.)[2]	1,534	5,007	6,669	13,266
Arable land per capita (ha.)	1966	2.41	0.89	0.57	0.86
	1977	1.87	0.62	0.42	0.63
	1985(est.)	1.21	0.48	0.33	0.49
	2005(est.)	0.65	0.26	0.18	0.26
Land under cultivation[3] ('000 ha.)	1977	680	1,197	1,131	3,007
	1983(est.)	823	1,448	1,368	3,639
As % of arable land available	1977	68	91	96	86
	1983(est.)	83	110	117	104
Arable land still available[4] ('000 ha.)	1977	315	118	42	475
	1983	172	-134	-196	-157

Source: National Rural Development Report, 1978, with additions.

Notes: 1 Ten per cent deducted for infrastructure (villages, roads, etc.).

2 Malawi total based on mean of minimum and maximum projections made by recent World Bank demographic consultant; regional breakdown assumed as in 1977.

3 Based on air photo interpretations, by Land Husbandry Branch 1975 and 1976, which indicate a 3.5% increase in cultivation.

4 Includes medium and long term fallow, areas lacking water and is likely to be fragmented (especially in the Southern Region). Thus Stobbs (1969) gives 8,320,000 acres under cultivation, or medium term fallow (1-8 years), which is virtually all the potential arable area.

Table 5.1.10 Size of Holdings on Customary Land, 1980-1 and 1968-9

District	Mean area cultivated per household in 1980-81		Mean size of farm holdings 1968-9	Proportion of holdings under 0.8 ha. 1968-9
	ha.	As % of Malawi average	ha.	%
Kasungu ADD	2.09	174		
Lilongwe ADD	1.38	115	Northern Region	
Ngabu ADD	1.36	113	1.42	31.9
Mzuzu ADD	1.35	112.5	Central Region	
Salima ADD	1.02	85	3.20	17.8
Karonga ADD	0.97	81	Southern Region	
Liwonde ADD	0.87	72.5	1.30	35.6
Blantyre	0.80	67		
of which Mulanje	0.69	57.5		
MALAWI	1.20	100	1.54	28.7

Sources: NSO National Sample Surveys of Agriculture 1968-9 and 1980-1

Note: Average number of persons living on smallholdings on customary land in 1968-9 was 4.6 and mean household size in 1980-1 was 4.5.

Table 5.1.11 Proportion of Female-Headed Households in Customary Land Farming Areas 1980-81

District	Proportion of female household heads	
Karonga ADD	15.7	
Mzuzu ADD	21.7	
Kasungu ADD	13.8	
Salima ADD	28.1	
Lilongwe ADD	27.2	
Liwonde ADD	36.7	
of which Namwera		42.3
Balaka		42.3
Blantyre ADD	34.1	
Ngaba ADD	24.0	
MALAWI	27.9	

Source: National Sample Survey of Statistics 1980-81

Table 5.4.1 Expenditure on Education in Malawi Compared to Other African Countries, 1975-79

Country	Expenditure on education as a proportion of GDP, 1975-79 %	Government expenditure %
Ethiopia	2.4	12.5 (1977)
Burundi	2.7	22.1 (1978)[1]
Malawi	3.5	8.1 (1979)
Madagascar	4.0	24.0 (1977)
Sudan	4.5	
Mauritius	4.7	12.1 (1978)
Somalia	5.1	14.6 (1977)
Botswana	5.4	19.0 (1978)
Kenya	5.9	18.0 (1979)
Zaire	6.0	22.0 (1976)
Swaziland	6.1[2]	12.2 (1978)
Zambia	6.8	25.0 (1976)
Tanzania	8.8	15.8 (1978)
Lesotho	12.0[3]	23.0 (1975)
Average	5.6	17.0

Source: IBRD, An Analysis of Malawi's Manpower 1979 Survey, November, 1980.

[1]Ministry of Education only.

[2]As % of GDP in current prices.

[3]Including foreign aid.

Table 5.4.2 Vacancies by Categories of Manpower, 1979

Category	Total employed	Vacancies	Vacancies as % of total posts
Farm managers	3,314	1,227	26.1
Managers	2,521	960	27.6
Production supervisors/ general foremen	3,645	611	14.4
Administrators	1,599	377	19.1
Executive officers	566	156	21.6
Other	471	167	26.2
All managerial positions	12,116	3,498	22.4
All professional and technical positions	11,680	2,893	20.3
Clerical and related workers	11,680	1,832	13.6
Bookkeepers, cashiers	3,443	694	16.8
Stenographer/secretary	1,420	417	22.7
Salesmen, shop assistants	2,390	325	12.0
Other	14,583	813	5.3
Intermediate level manpower	33,516	4,081	10.9
Drivers	7,755	1,115	12.6
Machinery fitters	4,421	626	12.4
Plumbers, etc.	2,647	438	14.2
Carpenters	3,647	410	10.1
Farm machinery operators	235	277	54.1
Painters	1,517	225	12.9
Tailors, etc.	1,432	217	13.2
Other	8,000	928	10.4
Total, skilled and semi-skilled jobs	29,654	4,236	12.5
Total, clerical and others	15,945	2,662	14.3

Source: Derived from 1979 Manpower Survey, Table 13.

Table 5.4.3 Manpower Situation for Posts of University Degree Equivalent, 1979

Category	Total posts	Total employed	Vacancies	Non-Malawians	Vacancies and non-Malawians as % of total posts	Proportion of total vacancies and non-Malawians %
Engineers	1,574	1,272	302	481	50	10.2
Engineering technicians	939	783	156	189	37	4.5
Surveyors, draughtsmen	565	413	152	150	53	3.9
Accountants/ auditors	1,001	712	289	408	70	9.1
Managers	3,239	2,359	880	1,411	71	29.9
Government administrators	1,973	1,597	376	240	31	8.0
Secondary school teachers	1,079	717	362	164	49	6.9
Other	6,459	5,283	1,176	928	33	27.5
TOTAL	16,829	13,136	3,693	3,971	46	100

Source: Derived from IBRD, Analysis of Malawi's Manpower 1979 Survey, Annex 9A.

Table 5.4.4 Projected Demand for Engineers/Diplomates/Technicians in Malawi

	Present need (1978)	Cumulative needs by 1983	Cumulative needs by 1988
Engineers			
Malawians	97	404	752
Expatriates	27	98	158
Total	127	502	910
Diplomates			
Malawians	164	815	1,605
Expatriates	32	146	230
Total	196	961	1,835
Technicians			
Malawians	344	1,743	3,599
Expatriates	46	148	250
Total	390	1,891	3,849

(Source: Derived from Engineering Manpower Survey, 1978)

Table 6.2.1 Tobacco: Hectarage of Estate and Customary Land, 1969-1979 ('000 ha.)

Year	Total	Proportion of total (%)		Estates		Customary land		
		Estate	Customary	Flue-cured	Burley	Sun/air cured	Fire-cured	Turkish
1969	35.1	19.7	80.3	2.8	4.1	7.5	20.5	0.2
1970	41.3	23.2	76.8	4.0	5.6	5.4	26.1	0.2
1971	50.2	26.1	73.9	5.8	7.3	6.9	29.9	0.3
1972	55.5	24.5	75.5	7.1	6.5	8.0	33.5	0.4
1973	50.1	28.9	71.1	7.9	6.6	6.5	28.9	0.2
1974	51.5	31.7	68.3	9.5	6.8	6.5	28.2	0.5
1975	50.1	35.5	64.5	10.7	7.1	4.7	27.2	0.4
1976	61.1	35.4	64.6	12.9	8.7	7.7	31.4	0.4
1977	66.6	36.0	64.0	15.3	8.7	7.3	34.6	0.7
1978	76.5	37.1	62.9	17.5	10.9	6.6	40.4	1.1
1979	80.1	40.8	59.2	18.9	13.8	5.7	40.9	0.8

Source: Statistical Yearbook.

Table 6.2.2 Tobacco: Number of Growers: Estates and Smallholders, 1970 and 1979

	Estates		Smallholders (Customary Land) ('000s)				
			Fire-cured			Sun/air cured	Turkish
	Flue-cured	Burley	Northern Division	Southern Division	Total		
1970	89	70	40.1	7.6	47.8	7.8	3.4
1979	253	601	49.0	6.1	55.0	8.7	9.8

Source: Statistical Yearbook.

Table 6.2.3 Availability of [illegible]lawi[1)]

Category	Northern Region	Central Region	Southern Region	Malawi
1. total acreage	6,638,080	8.787,460	7,814,500	23,240,040
2. acreage that can be cultivated under present technological limitations	2,223,866	3,783,134	2,869,980	8,876,980
3. customary land actually being used for agriculture	1,215,912	3,005,252	2,883,370	7,104,534
4. estate acreage	239,320	592,363	327,798	1,159,483
5. estates as % net area cultivable[2)]	12.0	17.4	12.7	14.5
6. balance of arable land[3)]	546,247	(192,796)	(628,186)	(274,735
7. number of years before all arable land is used at 3.5% per annum increase in cultivation	10	---	---	---

1) As of May 18, 1978.
2) Row 2 less: 10% of row 2 (assumed to be taken up by roads, dwellings and other such infrastructure).
3) Net area cultivable less row 3 and row 4.

Source: IBRD, Agro-Industrial Development, from memo dated May 18, 1978 by the Secretary for Agriculture and Natural Resources.

Table 6.4.1 AIMARC Net Profits (Loss) on Crop Trading at 1980 Prices,* 1971/2 to 1979/80 (thousand kwacha)

Year	Tobacco	Rice	Maize	Groundnuts	Cotton	General Produce	Total profit (loss) at 1980 prices
1971/2	12,795	(426)	(97)	4,864	1,852	(1,323)	17,665
1972/3	8,931	(344)	(154)	5,066	2,156	(3,076)	12,039
1973/4	5,351	313	3,294	3,697	3,044	(2,077)	13,622
1974/5	9,061	1,054	410	1,991	5,825	(2,911)	15,430
1975/6	17,623	(45)	(4,758)	2,103	767	889	16,579
1976/7	24,135	(1,657)	(2,470)	9,181	2,933	2,620	34,742
1977/8	36,996	(1,143)	(3,336)	3,638	2,019	2,006	40,180
1978/9	5,656	(916)	(4,463)	2,969	1,620	715	5,581
1979/80	3,191	(1,837)	(4,929)	4,412	544	(1,298)	83
Total profit loss over 9 years	123,199	(5,001)	(16,503)	37,921	20,760	(4,456)	155,920
Average annual profits	13,689	(556)	(1,834)	4,213	2,306	(495)	17,324

*Prices are calculated using the GDP deflator. Kwacha exchange rate can be taken as U.S. $1.2.

Source: Kydd and Christiansen, 1982.

Table 6.4.2 The Proportion of ADMARC Selling Prices Paid to Growers, 1953-1979

	5-year moving average of price received by peasant growers (kwacha/lb)	5-year moving average of price received by ADMARC at auction in Malawi (kwacha/lb)	Moving average price received by growers as proportion of auction price (%)
1953	0.062	0.126	49.2
1954	0.067	0.135	49.6
1955	0.076	0.138	55.1
1956	0.081	0.141	57.4
1957	0.081	0.135	60.0
1958	0.077	0.129	59.7
1959	0.076	0.133	57.1
1960	0.078	0.135	57.8
1961	0.075	0.139	54.0
1962	0.078	0.155	50.3
1963	0.086	0.161	53.4
1964	0.090	0.161	55.9
1965	0.089	0.152	58.6
1966	0.084	0.153	54.9
1967	0.082	0.172	47.7
1968	0.081	0.192	42.2
1969	0.088	0.234	37.6
1970	0.089	0.268	33.2
1971	0.096	0.290	33.1
1972	0.101	0.325	31.1
1973	0.106	0.405	26.2
1974	0.114	0.491	23.2
1975	0.130	0.610	21.3
1976	0.156	0.653	23.9
1977	0.187	0.661	28.3
1978	0.194	0.637	30.5
1979	0.208*	0.500*	41.6

* 3-year moving average

Source: Kydd and Christiansen, 1982, calculated from Compendium of Agricultural Statistics, 1977, updated as necessary. Third column added.