



Universiteit
Leiden
The Netherlands

A planning survey of the Northern Region, Malawi

Haan, L.J. de; Jong, J. de; Sterkenburg, J.

Citation

Haan, L. J. de, Jong, J. de, & Sterkenburg, J. (1975). *A planning survey of the Northern Region, Malawi*. Utrecht: University of Utrecht / Department of Geography. Retrieved from <https://hdl.handle.net/1887/4764>

Version: Not Applicable (or Unknown)

License: [Leiden University Non-exclusive license](#)

Downloaded from: <https://hdl.handle.net/1887/4764>

Note: To cite this publication please use the final published version (if applicable).

A PLANNING SURVEY OF THE NORTHERN REGION,

MALAWI

Leo de Haan

Jan de Jong

Jan Sterkenburg

Department of Geography of Developing Countries
University of Utrecht, The Netherlands

February, 1975

INTRODUCTION

This regional planning survey of the Northern Region has been written at the request of the Town Planning Department of the Ministry of Works and Supplies. Initially, it was intended to restrict the survey to the physical aspects of planning, the aspects of settlements, services, service centres and infrastructure in particular. Under an agreement between the Town Planning Department and the University of Utrecht, the authors were assigned the task of surveying the existing pattern of resources of the Northern Region of Malawi with a view to making recommendations for the improved organisation of physical development through plans and policies aimed at securing greater co-ordination of development effort, at strengthening and relationalizing infrastructural services, at identifying rural-urban relationships and generally at providing a basic framework for integral planning of the region's land uses.

Regional physical planning is, however, closely related to the economic and social development of an area. For the Northern Region agriculture is the basis of the economy and the source of employment for more than 90 % of its population. Consequently, aspects of physical planning cannot be dealt with without paying adequate attention to the agricultural sector, the existing constraints for raising productivity and the attempts of the Malawi government to improve this sector. An expanding agricultural sector earns foreign exchange, provides food for the non-agricultural population, and may increase rural incomes and provide a growing market for manufactured products. Moreover, a vigorous, commercialised agricultural sector demands a sophisticated level of services and creates employment in transport, marketing and processing and is likely to foster the growth of smaller towns and rural service centres.

This report, therefore, opens with an inventory of production activities, employment and physical infrastructure. It subsequently analyses the bottlenecks in the field of production and agriculture in particular - employment and infrastructure. The report concludes with a section focussing on a possible strategy for the development of the region, chiefly meant to stimulate discussion on this crucial issue, a section containing a tentative subdivision of the region into homogeneous areas for sub-regional and integrated planning, and some remarks about the planning of services and service centres.

The report has been based on a physical planning survey carried out in the Northern Region and a number of published and unpublished reports of various ministries. The survey was carried out by a team from the Town Planning Department and the Department of Geography of Developing Countries of the University of Utrecht, The Netherlands, during the period May-November 1972. Subsequent analysis of the data took place at Utrecht. A draft report was submitted to the Town Planning Department in April 1974. This final report is based on an amended version of the draft report in which account has been taken of comments made by the Town Planning Department.

Many people assisted in supplying information for the survey. Although it is not possible to mention all of them, we would like to single out the Chief Town Planning Officer, Mr. T.N. Msusa, who arranged for and co-ordinated the field work, and Mr. J.A.K. Munthali

who co-operated in the data collection. We would like to express our thanks for their invaluable help. Our thanks also go to the Regional Engineer and the Regional Agricultural Officer at Mzuzu, and their staff for their assistance. The views expressed in this report are, however, the authors, and do not necessarily coincide with those of the Ministry of Works and Supplies.

We hope this report will contribute to some extent to the development of the Northern Region and the increasing welfare of its population.

Utrecht, February 1975

The authors.

A PLANNING SURVEY OF THE NORTHERN REGION, MALAWI

CONTENTS	page
- Introduction	2
- List of tables	6
- List of maps	8
Part 1 THE COUNTRY	
1.1. Malawi in the Southern African context	10
1.2. The Northern Region in the national context	14
Part 2 THE NORTHERN REGION: AN INVENTORY	
2.1. Physical and demographic characteristics	20
2.2. Production	22
2.2.1. Agriculture and agricultural services, livestock, forestry and fishery	24
2.2.2. Other economic activities	40
2.3. Employment	46
2.4. Physical infrastructure	49
2.4.1. The transportation network	49
2.4.2. Urbanisation and the distribution and hierarchy of service centres	51
Part 3 THE NORTHERN REGION; AN ANALYSIS OF BOTTLENECKS	
3.1. The resources	60
3.2. Production problems	64
3.2.1. Agriculture & agricultural services and forestry	64
3.2.2. Other sectors of the economy	69
3.3. Employment	71
3.4. Social and physical infrastructure	72
3.4.1. Education and health	72
3.4.2. The transportation network	73
3.4.3. Service centres	75
3.5. Summary of major bottlenecks	77

Part 4	PROPOSALS FOR THE DEVELOPMENT OF THE NORTHERN REGION	
4.1.	Towards a strategy for the development of the Northern Region	82
4.2.	A sub-division of the Northern Region into planning areas	88
4.3.	Priorities between areas in the Northern Region	93
4.4.	Planning of services and service centres	97
Appendix I	Some basic data about the APPA's in the Northern Region	102
Appendix II	Recommendations for planning regions.	112
Bibliography		115

List of tables

- | | |
|----------|--|
| Table 1 | Visible trade balance of Malawi, 1969, 1970 and 1971
(in million K.) |
| Table 2 | Population numbers and densities per region in Malawi, 1972 |
| Table 3 | Percentage of population by region |
| Table 4 | Sex ratios of Malawi and the Northern Region, per age category |
| Table 5 | Marketed agricultural produce (in sh. tons and percentages) per region, Malawi, 1971-1972 |
| Table 6 | Northern Region, total land acreage available for cultivation, acreage under cultivation, size of the holdings and number of holdings by district, 1968/69 |
| Table 7 | Percentage of holdings by size of holding (acres) |
| Table 8 | Marketed agricultural value per capita, 1971/72 |
| Table 9 | Northern Region, value (K) of marketed agricultural production per crop; the contribution of each marketed crop to the total value (%); the contribution of the districts to the value of each crop and to the total marketed value (%), 1971/72 |
| Table 10 | Particulars of wet land rice settlement schemes |
| Table 11 | Particulars of dry land settlement schemes |
| Table 12 | Northern Region, cattle per holding and number of cattle per square mile in all districts, 1971 |
| Table 13 | Manufacturing and quarrying in the Northern Region, 1971 |
| Table 14 | Northern Region. The numbers of schools, the percentage of assisted schools, the average number of classes per school, the average enrolment per class and the enrolment ratio, in all districts, 1972 |

- Table 15 Northern Region, total recorded wage employment, the number of temporary employees, the total medical and educational employment to categories of occupation, November 1971
- Table 16 Northern Region, total recorded wage employment in all districts (number and %), the total population in the districts (%) and the recorded employment in the district centres (%), November 1971
- Table 17 Hierarchical classification of centres in the Northern Region
- Table 18 Acreage of land required to accomodate the region's population up to 1985; acreage under cultivation in 1969 and estimated acreage of unused cultivable land
- Table 19 Agricultural Production Planning areas in the Northern Region
- Table 20 Total value of the marketed agricultural production (K) in 1971/72 the estimated population (1971) and the value per capita (K) (1971'72) for all APPA's
- Table 21 Education Services, 1971-1985
- Table 22 Health facilities, 1972-1980

List of maps

Map 1	Agricultural potential	22
Map 2	Sex ratios per Traditional Authority	23
Map 3	Value of marketed agricultural production	27
Map 4a	Proportion of maize in value of marketed agricultural production	28
Map 4b	Proportion of rice and groundnuts in value of marketed agricultural production	29
Map 4c	Proportion of orientiel tobacco, coffee and cotton in value of marketed agricultural production	30
Map 5	Agricultural research facilities	34
Map 6	Agricultural services: extension and training	35
Map 7	Agricultural marketing facilities	36
Map 8	Cattle population	38
Map 9	Education services	41
Map 10	Hospital services	43
Map 11	Medical services	44
Map 12	Roads	50
Map 13	Transportation routes	52
Map 14	Service centres	54
Map 15	Agricultural production planning areas and planning regions	90

PART I THE COUNTRY

CHAPTER 1.1.

MALAWI IN THE SOUTHERN AFRICAN CONTEXT

The Republic of Malawi is situated between $9^{\circ}20'$ and $17^{\circ}20'$ southern latitude and between 33° and 36° eastern longitude in the southeast of the African continent along Lake Malawi. Compared to its neighbours Tanzania, Zambia and Mozambique the country is small. The total area is 45,366 square miles, of which 36,686 square miles are land area and 8,680 square miles consist of lakes. Moreover, with its length of 520 miles and its width varying between 50 and 100 miles, the shape of Malawi is long and narrow. Thirdly, the country is landlocked. Its southern tip is 230 miles from the seaport of Beira, its northern tip is no less than 750 miles from that port.

Malawi occupies part of the Great Rift Valley system. Dominant features in its landscape are two troughs with high plateaus east and west of them. Consequently the country shows a great variety of climatological conditions. Both rainfall and temperature are strongly affected by altitude: the plateaus are cool with an average annual precipitation of 64 inches, whereas the troughs are relatively hot and in some places semi-arid. The climate is characterised by one wet season from the end of November-early December to March-April with a peak in January-March.

The present population of Malawi is in all probability composed of groups which settled in the area during the 14-15th centuries and during the 18-19th. In the 19th century Portuguese and Arab traders arrived in the country to trade in metals, ivory and slaves. Towards the end of the century European missionaries and farmers settled in the area and in 1907 the country, now named Nyasaland, became a British protectorate. The missionaries focussed their activities on the northern part of the country, whereas the settlers concentrated their interests in the South. Pressure by these white settlers led to the establishment of the Federation of Rhodesia and Nyasaland, in which Nyasaland was assigned the role of supplier of cheap labour. In the early nineteen-sixties opposition to the colonial status and the subordinate position of Nyasaland in the Federation, mounted. In 1964 Nyasaland obtained its independence, and in 1966 it became the Republic of Malawi.

On the basis of the 1966 Population Census and an estimated growth rate of 2.5% for rural areas and 3.5% for urban areas, the 1972 population was calculated to be 4,696,437. This corresponds to a density of 129 persons per square mile, which makes Malawi one of the most densely populated countries in Africa. It far surpasses the neighbouring countries: Zambia 13 persons per sq. mile, Mozambique 23, Rhodesia 28 and Tanzania 28. The high density and the absence of alternative sources of money income in the country resulted in a strong labour migration to Zambia, Rhodesia and South Africa. An estimated 270,000 Malawians are working in these countries, which equals 13% of the men in the active age categories still living in Malawi. This migration is of crucial importance for the economy of the country. Migrants can save up to R 1000 in a 18 month stint at the mines. The total money inflow into Malawi is worth about K 36 million at current wage rates, which equals about half the 1973 export earnings of the country.¹

If an average population growth rate of 2.8 per cent per annum is adopted the population will by the year 2000 reach the 10 million mark. In view of this and the existing high population densities in various parts of the country, Malawi will have to take steps to raise agricultural productivity considerably and to accomodate part of this population in urban areas through the development of non-agricultural activities.

The dominant feature of the Malawi economy is the high degree of subsistence activities. In 1971, 40% of the G.D.P. came from the non-monetary sector, chiefly the agricultural subsistence sector. No less than 95% of the total population lives in the rural areas and depends on agriculture as the main source of income. More than 90% of the total domestic exports consists of agricultural products, half of which is produced by a limited number of tobacco and tea estates. The other half comes from smallholder production, with tobacco, groundnuts and cotton as the main export crops.

The annual growth of total agricultural production has amounted to 9% since Independence (current prices). This average figure hides differences for the estate and the smallholder sector. The former achieved a growth rate of 16% per annum against 7% for smallholder subsistence production and 14% for smallholder cash sales. This increase of smallholder production since 1964 should however mainly be explained in terms of price increases and low production levels for the base year. After initial output increases for most products in the years immediately following Independence, only cotton and rice maintained such increases, whereas maize, pulses, and tobacco decreased in total output.² For 1973 the figures show an overall decrease in smallholders output (0.5%) against an increase of 17.5% for the estate sector.³

Performance of the manufacturing sector since Independence indicates a growth rate of 20% per annum for the period 1964-1970. Again, this high rate has mainly to be explained in terms of the low base from which it is measured. Industries in Malawi are broadly divided into supply-based, i.e. those processing primary commodities produced in the country, and demand-based, i.e. those established to meet the internal demand for manufactured products. During the 1964-1970 period demand-based industries in particular expanded considerably. Employment in both types almost doubled from 11,100 in 1964 to 20,000 in 1969. Output increased from 8.3% of G.D.P. to 12.5% in 1970.⁴ Nevertheless, manufacturing industries are still of limited importance in Malawi, compared with other sectors of the economy, notably agriculture, both in terms of output and contribution to G.D.P. but particularly in terms of employment.

Thus Malawi is basically a producer of agricultural primary products for the world market, and an importer of manufactured goods with all the inherent disadvantages.

This structure of the economy explains the relative absence of urban living: only 5% of the total population lives in urban areas. Moreover, large numbers of people in the urban areas continue to depend on the economic and consequently on the social system of their home areas. For many of them this is a sheer necessity in view of the prevailing low wages and the absence of sufficient social security for the aged. Others use the opportunities created by the policy of granting freehold title to land, a higher level of education and higher incomes to invest in commercial types of agriculture.

Malawi's development policy aims at an increase in the production of export crops, in order to raise the capital needed for the diversifica-

tion of the economy. Moreover, the country is attempting to become self-sufficient in food, maize in particular. A third major element of its development policy is the improvement of the internal communication system which is at present heavily biased in favour of the southern part of the country.

Table 1
Visible trade balance of Malawi 1969, 1970 and 1971 (in million K.).

Composition of export by main commodity					Composition of import by types of commodity			
commodity	1969	1970	1971		commodity	1969	1970	1971
smallholder crops	18.1	17.8	23.5		goods mainly for final consumption	18.8	19.7	21.0
tobacco	6.4	8.3	11.4		capital equipment	15.4	17.2	17.1
groundnuts	5.6	4.2	5.9		building & construction materials	6.0	5.4	6.2
cotton	1.7	2.8	2.5		other goods mainly for intermediate consumption	20.0	27.6	31.1
others	4.4	2.5	3.6		others, including unallocatable	1.4	1.6	2.4
estate crops	16.2	19.5	22.4					
tobacco	6.2	8.2	10.4					
tea	9.6	10.9	11.7					
other	0.4	0.4	0.3					
other products	2.4 ⁺	3.0 ⁺	3.1 ⁺					
total domestic export	36.6	40.3	49.0					
re - export	7.4 ⁺	9.0 ⁺	9.6 ⁺					
total export	44.0	49.3	58.6		total imports	61.5	71.5	77.8

Source: National Statistical Office, Malawi.

CHAPTER 1.2.

THE NORTHERN REGION IN THE NATIONAL CONTEXT

Malawi is administratively sub-divided into three regions: the Northern Region, the Central Region and the Southern Region. There are marked differences between these regions in terms of physical resources, population and urbanisation, production structure and infrastructural facilities. In almost all respects the Northern Region occupies a backward position.

More than elsewhere in Malawi the Northern Region has very rough relief forms, resulting in large uncultivable areas which explains the lower agricultural potential of the region, while for the same reason temperature is on average somewhat lower and rainfall on average somewhat higher than in the rest of Malawi.

Both total population and population density decrease from south to north in Malawi.

Table 2
Population numbers and densities per region in Malawi, 1972.

region	area in sq. miles	% of Malawi	estimated po- pulation 1972	% of Malawi	density per sq. mile
Northern Region	10,376	28.5	577,658	12.3	55.6
Central Region	13,714	37.8	1,712,245	36.5	125.0
Southern Region	12,233	33.7	2,406,534	51.2	196.0
Malawi	36,323	100.0	4,696,437	100.0	129.3

Source: Malawi Population Census, 1966.

The Northern Region has the lowest share in the country's total population (12.3%) and the lowest density (55 persons per sq. mile). The Northern Region's growth rate remains behind that of the Central and particularly the Southern Region and, consequently, below the national average. If these trends persist, the Northern Region's share in Malawi's total population will decrease to 9% in the year 2000. The distribution of the population over the regions is given in the table 3 below.

Table 3
Percentage of population by region.

region	1911	1921	1931	1945	1966	1980	1990	2000
Northern Region	19	18	14	14	12	11	10	9
Central Region	40	39	39	37	36	35	34.5	34
Southern Region	41	43	47	49	52	54	55.5	57

Source: Master Plan for Lilongwe, The Capital City of Malawi, 1968,
p. 6.

This lower growth rate does not result from a lower natural increase: it is caused by out-migration to other parts of Malawi and other countries. Although exact information about the growth rate and migration is lacking, the sex-ratio per age group shows a distinct shortage of men in the productive age categories.

Table 4

Sex ratios of Malawi and the Northern Region, per age category.

age category	sex-ratios	
	Malawi	Northern Region
0 - 14	98.2	97.5
15 - 60	82.2	74.9
60+	101.3	88.5
all ages	89.9	85.3

Source: Malawi Population Census, 1966.

In other words, the net migration loss is higher in the Northern Region as compared with the other regions. As a result of this migration the overall population distribution is likely to become increasingly unbalanced with a high concentration of the total population in the Southern Region.

The process of urbanisation is still in its initial phase in Malawi. Until recently rural-urban migration was directed to the Southern Region; the agglomeration~~s~~ of Blantyre-Limbe and Zomba being the main poles of attraction. The construction of the new capital of Lilongwe channelled part of this flow to the Central Region. Of the 3 towns with more than 20,000 inhabitants, none is located in the Northern Region. In 1966 4.2% of the region's population was living in urban areas, compared with 5% for the country as a whole.⁵ On the other hand, no less than three-quarters of the total urban population is concentrated in the Southern Region, as against 17% for the Central and only 9% for the Northern Region.

The Northern Region's economy shows a stronger domination of agricultural production activities than the other regions. In the 1971/72 season, the region contributed 9.8% of the marketed production of maize, 7.6% of tobacco, 4.0% of groundnuts and 2.7% of pulses. These figures indicate the high degree of subsistence activities. Only paddy rice, of which the Northern Region produces almost one-third of the country's marketed production, and coffee take more prominent places, but neither crop is as yet important in Malawi's total marketed production.

The Malawi Government has initiated a number of projects to raise agricultural production in the Northern Region. Government activities comprise the establishment of 7 settlement schemes in unoccupied areas of projects providing a package of inputs to farmers in parts of the region already cultivated, such as the West Mzimba Land Utilization Project, the Kawalazi Tea Development Area and a large-scale agricultural improvement project, viz. the Karonga Rural Development Project.

Table 5
Marketed agricultural produce (in sh. tons and percentages) per region, Malawi, 1971-1972.

region	groundnuts		maize		pulses		coffee	
	sh. t.	%	sh. t.	%	sh. t.	%	sh. t.	%
Southern Region	7,968	19.5	23,276	60.2	12,965	70.1	-	-
Central Region	31,310	76.5	11,610	30.0	5,024	27.2	5	3.1
Northern Region	1,618	4.0	3,761	9.8	495	2.7	162	96.9
Malawi	40,896	100.0	38,647	100.0	18,484	100.0	167	100.0

cotton		paddy rice		tobacco		sunflower seed		tea	
sh. t.	%	sh. t.	%	sh. t.	%	sh. t.	%	sh. t.	%
19,614	80.0	10,856	57.1	1,220	0.9	3,159	84.8	446	98.2
4,754	19.4	2,359	12.4	14,708	91.5	566	15.2	-	-
144	0.6	5,798	30.5	142	7.6	-	-	8	1.8
24,512	100.0	19,013	100.0	16,070	100.0	3,725	100.0	454	100.0

Source: Admarc and Ministry of Agriculture.

Fish production in the region is proportional to its share in the total population (11%). On the other hand the position of the Northern Region concerning livestock seems more favourable, since 31.8% of Malawi's total of cattle is found here.

The Northern Region produces a slightly more than proportional share of Malawi's timber production (17%) while the largest part of the country's forestry-plantations are found in the Vipya Pulpwood Project.

The bulk of the existing industries are situated in the Southern Region, while recently at Lilongwe the first attempts were made towards encouraging industrial development in the Central Region. But in the Northern Region hardly any industrialisation has as yet occurred.

The development of a road and transportation network mainly took place in the Southern Region and recently in the Central Region. A similar situation exists for the railways. Lake service facilities are poor. As a result the Northern Region's infrastructural facilities compare unfavourably with the rest of the country. The construction of the Lakeshore Road which is currently taking place may bring some improvement.

To summarize: within the developing country of Malawi, the Northern Region occupies the rearmost position as regards physical and socio-economic development. The region is thinly populated, while a more than average out-migration causes a male shortage in the working age categories. Moreover, it is peripherally situated with respect to the economically important parts of the country, a fact which is aggravated all the more by the poor quality of its communication network. More than in any other part of Malawi, the region's economic basis is formed by agricultural production, chiefly for home consumption.

- 1) Africa Research Bulletin, Economic, Financial and Technical Series, Vol.11, No. 9, October 31, 1974, p. 3253.
- 2) See Economic Report 1973, Compendium of Agricultural Statistics 1971.
- 3) See Annual Report Reserve Bank of Malawi, quoted in Africa Research Bulletin, 1974, Economic, Financial and Technical Series p. 3292.
- 4) Statement of Development Policies 1971-1980, Government Press, Zomba, December 1971, chapter V.
- 5) See Malawi Population Census 1966, Final Report, table 7, p. 34. This census classifies places as "urban" if they possess certain urban characteristics. As a result there are no fewer than 51 places in Malawi classified as urban, varying between 100,000 and 200 inhabitants. Only half of them have more than 1000 inhabitants.

PART 2 THE NORTHERN REGION: AN INVENTORY

CHAPTER 2.1.

PHYSICAL AND DEMOGRAPHIC CHARACTERISTICS

The Northern Region which covers 10,376 sq. miles has administratively been divided into five districts: Chitipa, Karonga, Rumphi, Mzimba and Nkhata-Bay. The most dominant relief features in the region are the high-altitude plateaus and the hill zones. These are the Nyika and Vipya plateaus (6,000 ft.) and the Rift Valley Scarp Zones (4,000 - 6,000 ft.) which border the Lake between Chitimba and Nkhata-Bay. The relief forms break up the Northern Region's Landscape. West of the plateaus and hills, there is a group of plains (3,400 - 4,400 ft.) consisting of the Chitipa lowlands and the river basins of the South Rukuru and Kasitu in Rumphi and Mzimba, while east of the plateaus the Lakeshore Plains stretch from Chitipa northward and from Nkhata-Bay southward.

The agricultural potential of the region is chiefly determined by soils and climatological factors. The four main soil classes in the Northern Region are lithosols, latosols, alluvial soils and hydromorphic soils. Lithosols and latosols occupy the largest part of the region; lithosols occur in the dissected, steeply sloping Rift Valley Scarp Zones and isolated mountains and hills. Latosols cover the more gently sloping areas with free drainage. Soil characteristics such as soil depth, chemical fertility, drainage and acidity form an important indication for the agricultural potential of the region. As regards soil depth, the eroded stony and shallow lithosols are hardly suited to agricultural use. Chemical fertility is relatively high in the "young" alluvial soils. The fertility of these soils, which mainly occupy the Central part of the Karonga Lakeshore, results from the deposits of sediment on the surface. The fertility of latosols is generally lower than that of the alluvial soils (except for ferruginous soils in Misuku and Ekwendeni area), due to a moderate to high degree of weathering and leaching of the mineral reserves, resulting in a relative enrichment in iron and aluminium compounds. Alluvial soils are characterised by a wide range of textures, predominantly fine sand and silt. They may contain clay-layers of low permeability, impeding drainage.

The hydromorphic soils, occupying the valley floors of the South Rukuru River and the dambo areas in Vwaza, the Karonga Lake Shore Plain and the Nkhata-Bay Lowlands are waterlogged for a substantial part of the year. Drainage measures are required as a precondition for arable use. Finally, the acidity of the soils influences the choice-pattern of crops. The production of maize, groundnuts and rice requires a pH of about 5.5 - 6.5. Perennial crops such as coffee and tea allow a more acid profile. Latosol profiles are generally moderate to strongly acid (pH 4.0 - 5.5), alluvial profiles, weakly to moderately acid (pH 5.5 - 6.5).

Besides soils, temperature and rainfall also determine the agricultural potential of the region. Temperature decreases with increasing altitudes, limiting the growing season in the mountainous areas. Rainfall is concentrated in the period from November to April, whereas total annual precipitation decreases from East to West.

In the dissected areas of moderate slopes and steep hill areas, erosion diminishes the agricultural potential in the long run. At the present state of knowledge 46% of the total land area of the Northern Region is cultivable, of which less than 1% is suitable for irrigation.

We may distinguish three main areas, each with a specific type of potential (see map 1): the warm and dry Western Plains (Ai, B), the hot and wet Lakeshore Plains (Aiii, Cii) and the cool and wettish mountainous zone (Ci, E, D) in between. The last has less potential than the other two because of lower temperatures, a shorter growing season and poorer soils. Climatic factors, rainfall in particular allow one growing season only: from November/December until May/June.

The region's population was estimated at 577,658 in 1972. Outside the Western Plains, the Upper South Rukuru Valley and the Lakeshore plains, which are the agriculturally most attractive areas, the population density is very low. 48.4% of the total population constitutes the potential labour force, which includes both males and females between 15 and 60 years. The dependency ratio, i.e. the number of non-economically active per 100 economically active people, is 107. This dependency ratio is influenced by an outmigration mostly temporary of males in the productive age categories to the urban areas and estates in other parts of Malawi, or to mines and plantations abroad (see table 4). This outmigration is reflected in the sex ratios for the Traditional Areas which vary between 94 and 77 males per 100 females (map 2). In most urban areas in the Northern Region, in particular the district centres and the regional capital, the male population exceeds the female, albeit slightly. Only Rumphi shows a rural ratio. This points at a modest rural-urban migration within the Northern Region.

The quality of the labour force is largely determined by the health conditions and the quality of education. The health situation in the Northern Region is generally considered poor in spite of relatively well-developed health facilities. There are 2.07 hospital beds per 1,000 inhabitants which compares favourably with the national average of 1.30. These facilities differ however strongly from district to district (see map 10). These are chiefly of a curative nature. Low levels of agricultural production and income and the consequent low standard of living, have an unfavourable effect on the general state of health of the region's population. According to the 1966 population census, only 6.6% of the region's population of fifteen years and over completed full primary school. A much more favourable picture is given by the present enrollment ratio, i.e. the number of schoolgoing children in the age group 6 - 13 years per 100 children in that age group. This enrollment ratio is 77.7 for the Northern Region which significantly exceeds the national average of 37.2. In addition, the existing secondary school capacity is entirely used. This also applies to the Teacher Training Colleges and the Technical Schools (table 14).

Map 1
Agricultural potential

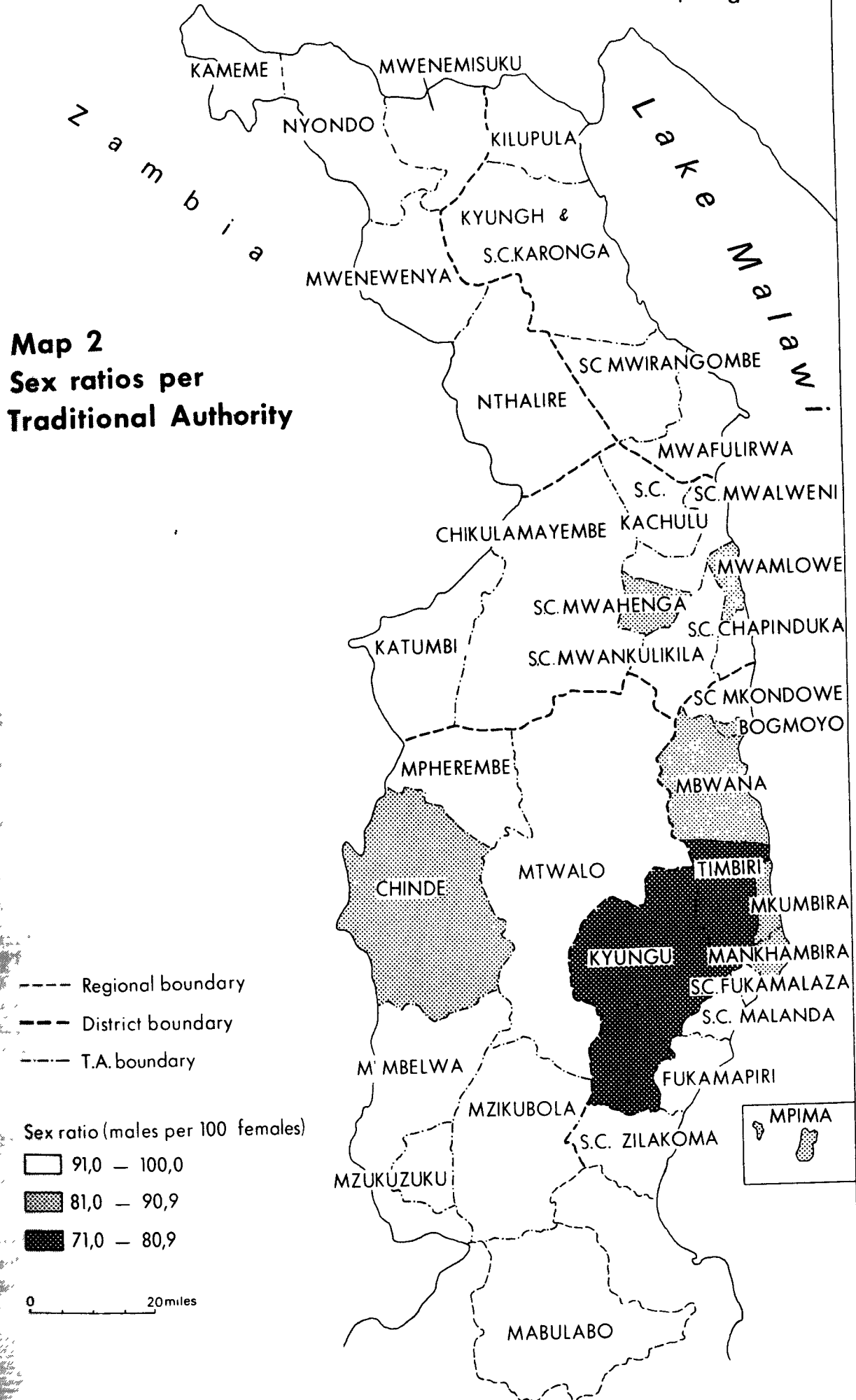
-  Intensive farming: maize, groundnuts, tobacco
-  Intensive farming: maize, cotton, rice
-  Intensive farming: foodcrops
-  Extensive farming: maize, groundnuts, tobacco
-  Perennial crops: coffee, tung
-  Perennial crops: tea, rubber, cacao
-  Livestock ranching
-  Afforestation
-  Game reserve
-  Marsh
-  Natural forest

0 20 miles

Source: Young A. Brown P., The Physical Environment of Northern Nyasaland, Zomba 1962
Brown P. Young A., The Physical Environment of Central Malawi, Zomba

Map 2

Sex ratios per Traditional Authority



CHAPTER 2.2.

PRODUCTION

The Northern Region can be sub-divided into three physiographic regions with consequent differences in population density and cropping pattern. These three regions are (1) the Western Plains which occupy large parts of the Mzimba district and some smaller parts of Rumphu and Chitipa districts, (2) the Lakeshore Areas of Karonga and Nkhata-Bay districts and (3) the scarp zones and high mountainous areas located between the Western Plains and the Lakeshore Areas.

The Western Plains are in some parts densely populated (26 - 200 persons per square mile). Smallholder agriculture is mainly directed to the cultivation of maize, groundnuts and pulses with some oriental tobacco. In recent years, three burley tobacco schemes and about four large tobacco farms have been established.

The Lakeshore Areas form the most densely populated part of the region (more than 200 persons per sq. mile). Cassava and rice are the major food crops, while the latter also forms the main cash crop. The production of cash crops occupies a more prominent position here than in the other parts of the Northern Region. Part of the marketed production comes from four rice settlement schemes. In the Nkhata-Bay lowlands, estate production of rubber and tea is found, while tea is also grown in a smallholder project area.

The scarp zones and mountainous areas are sparsely populated (0 - 25 persons per sq. mile). Apart from the coffee areas of Misuku, Phoka, Vipya North and North Nkhata-Bay, very little smallholder agriculture occurs. In these areas cassava, maize and beans are the staple food crops. In the Vipya Mountains, the large-scale Vipya Pulpwood Project has been established.

2.2.1. Agriculture and agricultural services, livestock, forestry and fishery.

Agriculture and agricultural services.

Agriculture forms the basis of existence of the Northern Region. Smallholder agriculture strongly dominates in this part of Malawi, not only in terms of employment but also as far as the area under cultivation and output are concerned. A small fraction of the smallholders are organised in settlement schemes, set up by the government in order to improve and commercialise agriculture. Apart from the smallholder farms and the settlement schemes, two other types of agricultural establishment can be distinguished: large farms owned by individual Malawian citizens and foreign- or government-owned estates.

Almost half of the total land area is to a varying degree suitable for agricultural use. At present, only 13.5% (412,000 acres) of all cultivable land is put under cultivation. The large farms and estates occupy a mere 0.7% of all cultivable land. The total number of holdings in the Northern Region is about 117,000. The average size of a holding is 3.5 acres, but this figure hides a substantial variation between the various districts.

Table 6.

Northern Region, total land acreage available for cultivation, acreage under cultivation, size of the holdings and number of holdings by district, 1968/69.

district	total land acreage ('000)	acreage available for cultivation ('000) % ¹	acreage under cultivation ('000) % ²	average size of holdings (acres)	number of holdings ('000)
Chitipa	1,058	378 35.7	41 10.8	2.9	14.4
Karonga	827	287 34.7	59 20.6	3.5	16.8
Rumphi	1,176	336 28.6	30 8.9	3.3	9.3
Mzimba	2,572	1,771 68.9	245 13.8	4.7	52.6
Nkhata-Bay	1,009	282 27.9	37 13.1	1.5	24.0
Northern Region	6,642	3,054 46.0	412 13.5	3.5	117.1

Source: N.S.S.A. 1968/69

Compendium Agricultural Statistics 1971

- 1) acreage available for cultivation expressed as a percentage of total land acreage
- 2) acreage under cultivation expressed as a percentage of the acreage available for cultivation.

Moreover the percentage distribution of holdings by size shows that the majority of the holdings are smaller than 1.6 acres for the region as a whole (about two-thirds) while, again, considerable inter-district differences are noticeable.

Table 7.

Percentage of holdings by size of holdings (acres).

district	< 1.9	2.0-3.9	4.0-5.9	6.0-11.9	12.0 ⁺	total acreage ('000)
Mzimba	14.0	35.7	23.9	24.2	2.2	52.6
Chitipa	31.6	49.9	11.9	6.6	-	14.4
Karonga	27.8	38.7	20.2	10.2	3.0	16.8
Rumphi	30.1	41.1	15.9	12.3	0.6	9.3
Nkhata-Bay	75.0	17.5	6.2	1.2	-	24.0
Northern Region	31.9	34.6	17.6	14.4	1.5	117.1

Source: N.S.S.A. 1968/69

Maize is the major food crop. Two-thirds of the total cultivated area is put under maize (110,000 acres), although it is - to a large extent - interplanted with other crops such as groundnuts and pulses. Pulses with 72,000 acres, cassava (37,000), groundnuts (36,000) and millet/sorghum (30,000) are the other important crops in terms of acreage.

Average yields per acre are low: maize yields are estimated at 730 lbs/acre and groundnut yields at 430 lbs/acre¹. For the other crops no

reliable yield figures are available. Estimates of the total production of maize for the 1968/69 season give 99,100 sh. tons of which only 1,000 sh. tons were marketed. This figure refers to produce handled by Admarc. Trade at local markets is excluded. For groundnuts these figures were 19,000 and 2,000 sh. tons respectively. These figures already indicate the importance of self-consumption. Apart from the quantities of marketed crops and their low value per capita, the subsistence character of smallholder agriculture in the Northern Region is also apparent from the low incidence of farmers growing commercial crops, and the small part of the holding reserved for these crops.

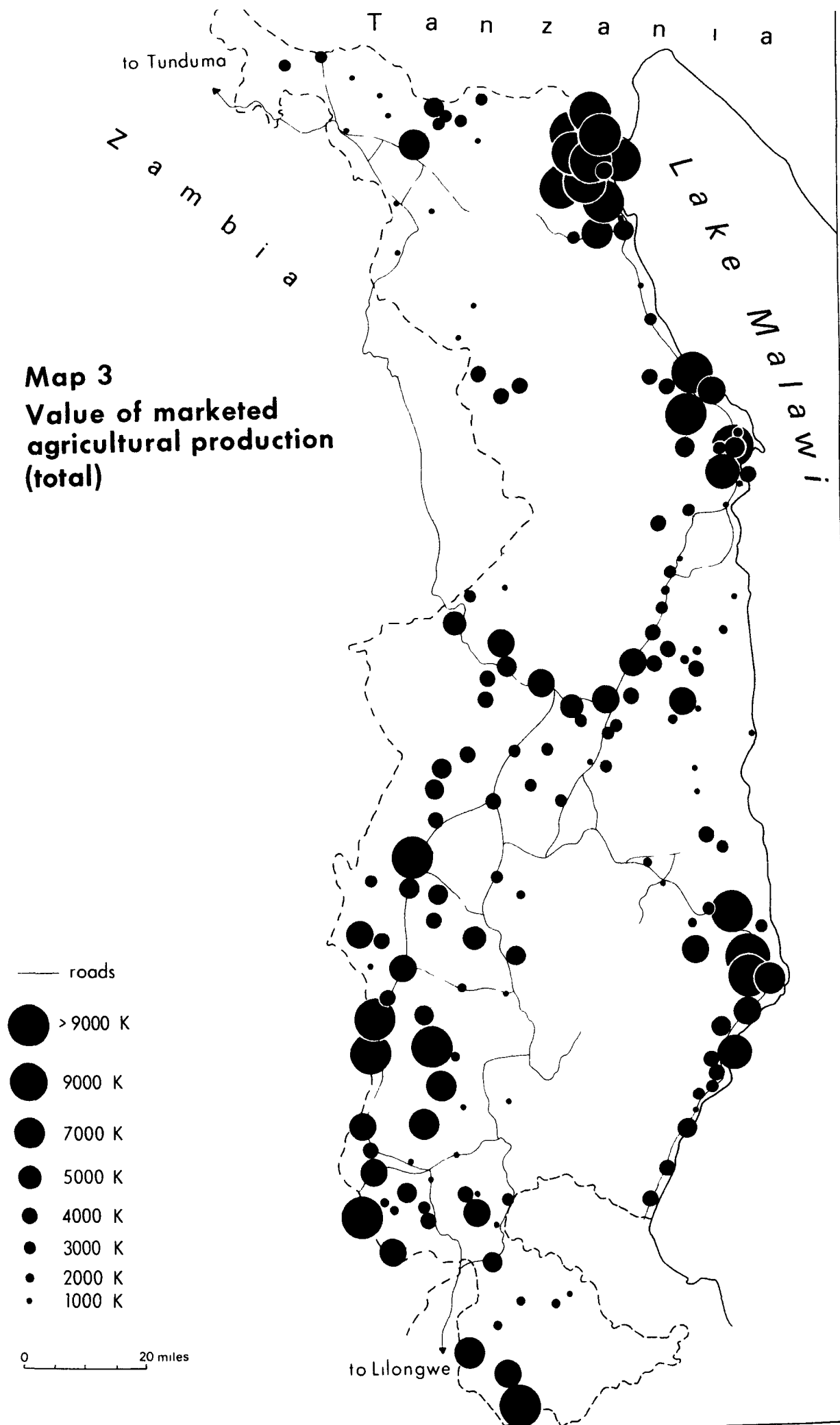
Table 8
Marketed agricultural value per capita 1971/72.

district	total marketed agricultural value (K)	population, 1971	value (K) per capita
Chitipa	27,532	67,276	0.41
Karonga	396,050	88,968	4.45
Rumphi	86,327	52,745	1.64
Mzimba	270,245	260,570	1.04
Nkhata-Bay	133,213	94,922	1.40
Northern Region	913,367	564,481	1.53

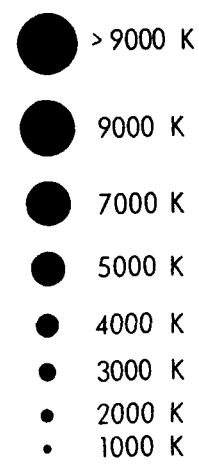
Source: ADMARC, STA, SCA, Ministry of Agriculture, personal communications.

The degree of commercialisation varies from district to district. In 1971/72 about 750 acres were under oriental tobacco in the districts of Mzimba and Rumphi. The number of growers amounted to 3700 and the acreage per holding under oriental tobacco did not exceed 0.5. In places cotton is produced on 1-2 acres per holding. Furthermore, in 1972 80 growers in the Kawalazi area cultivated about 160 acres of tea. Returns are low; in 1971 55 growers produced 16,666 lbs of green leaf, which represented an average cash value of K 7.5 paid to the grower before deduction of inputs. The production per grower increased considerably, however, in 1972. Nevertheless, the interest in tea cultivation on the part of the farmers seems to be limited, and the S.T.A. concentrates its efforts on Mulanje and Thyolo in the Southern Region. Coffee growing is of more importance. The 1973 coffee census gave a total of 3220 growers producing on average 190 tons per annum. This equals 118 lbs of parchment per grower and represents an average cash value of K. 24 per grower after deduction of processing and marketing costs (1973). The main coffee areas are the Misuku Hills and Vipya North (Mphompha), together representing 62% of the growers and 70% of total output. At present, rice is the most important commercial crop in the Northern Region. Although primarily grown as a food crop for home consumption in the dambos of the Karonga and Nkhata Bay Lakeshore areas, the marketed quantities constitute more than half of the total marketed agricultural value of the region (map 4 B).

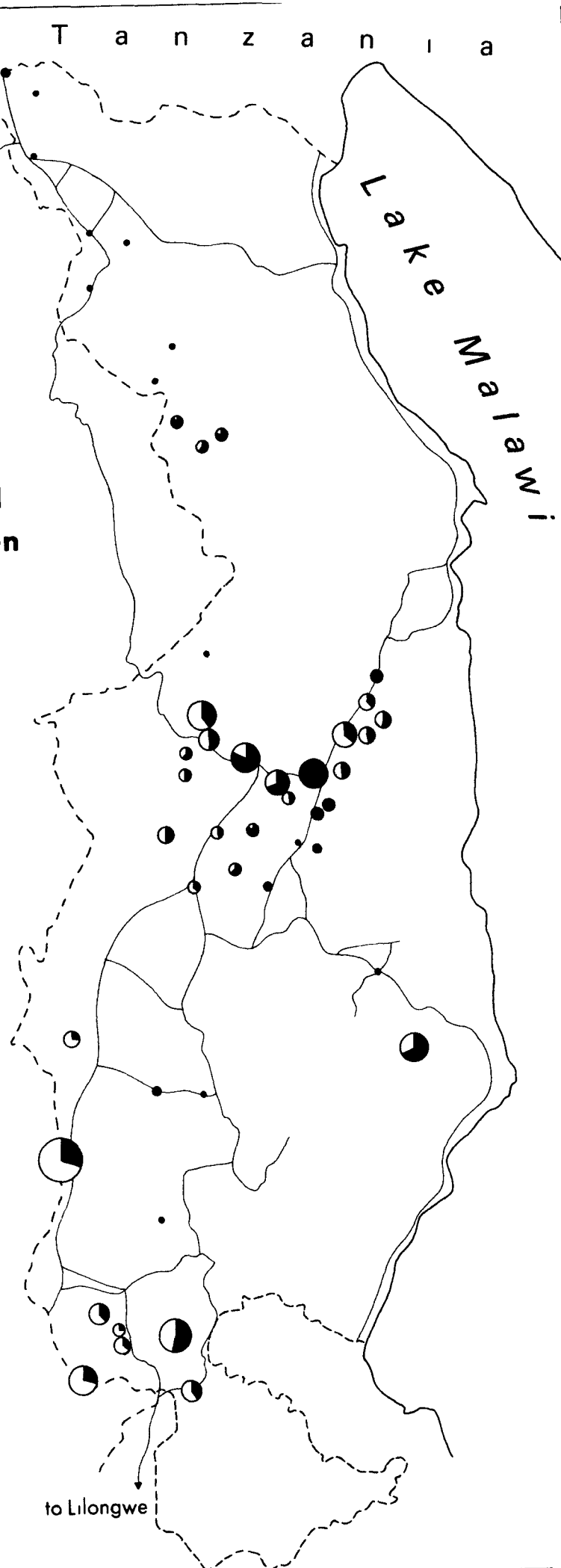
Map 3
Value of marketed
agricultural production
(total)



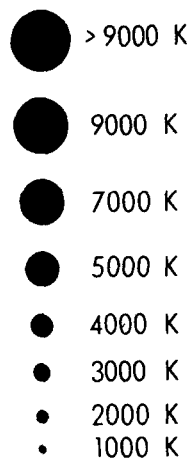
Map 4a
Proportion of maize
in value of marketed
agricultural production



0 20 miles



Map 4b
Proportion of rice and
groundnuts in value
of marketed agricultural
production

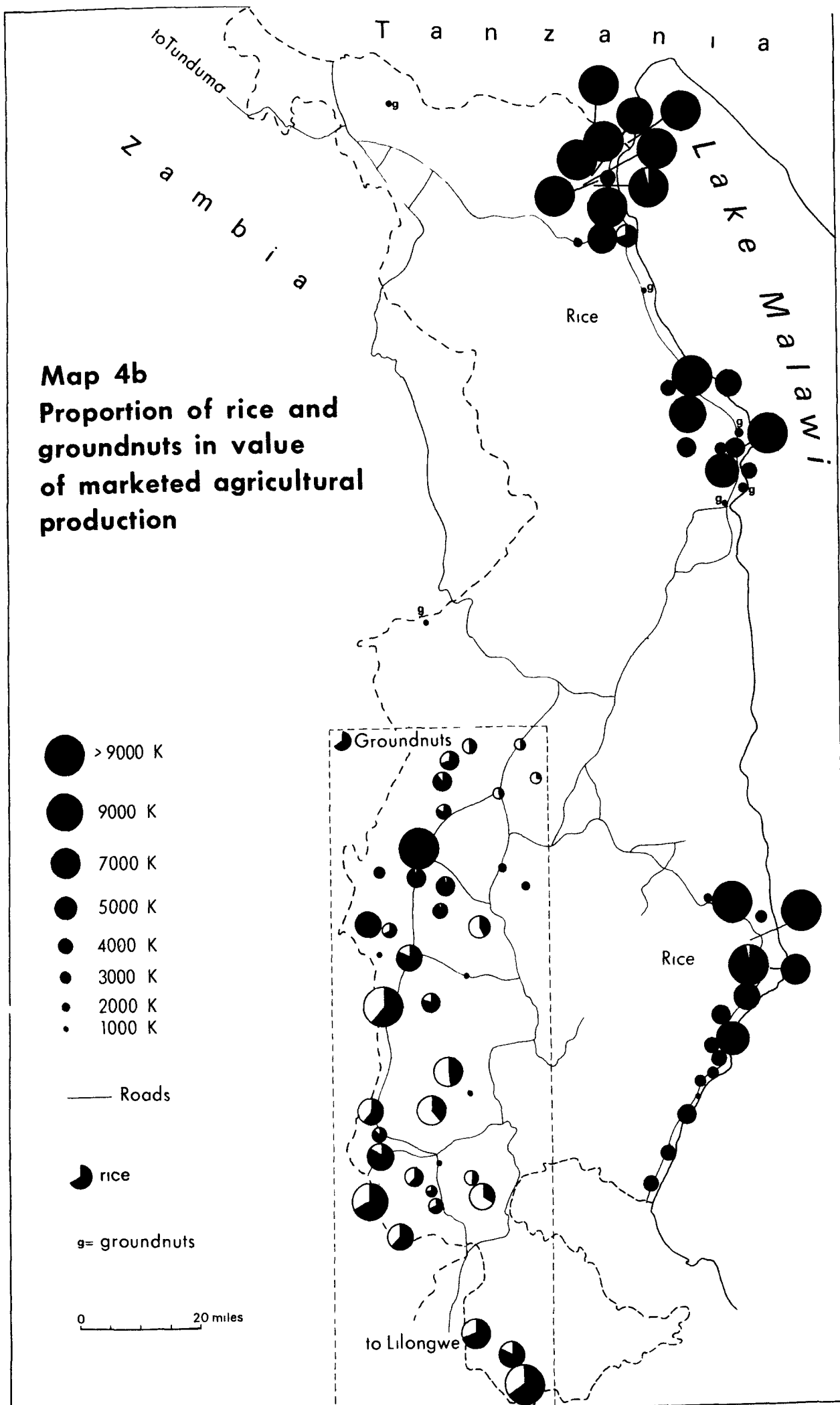


— Roads

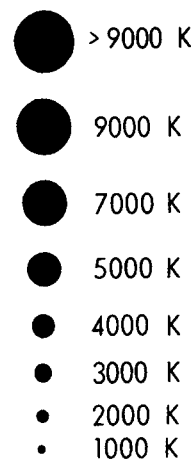
◐ rice

g= groundnuts

0 20 miles



Map 4c
Proportion of oriental
tobacco, coffee and cotton
in value of marketed
agricultural production



— Roads

☾ Coffee

c= Cotton

0 20 miles

☾ Tobacco

to Lilongwe

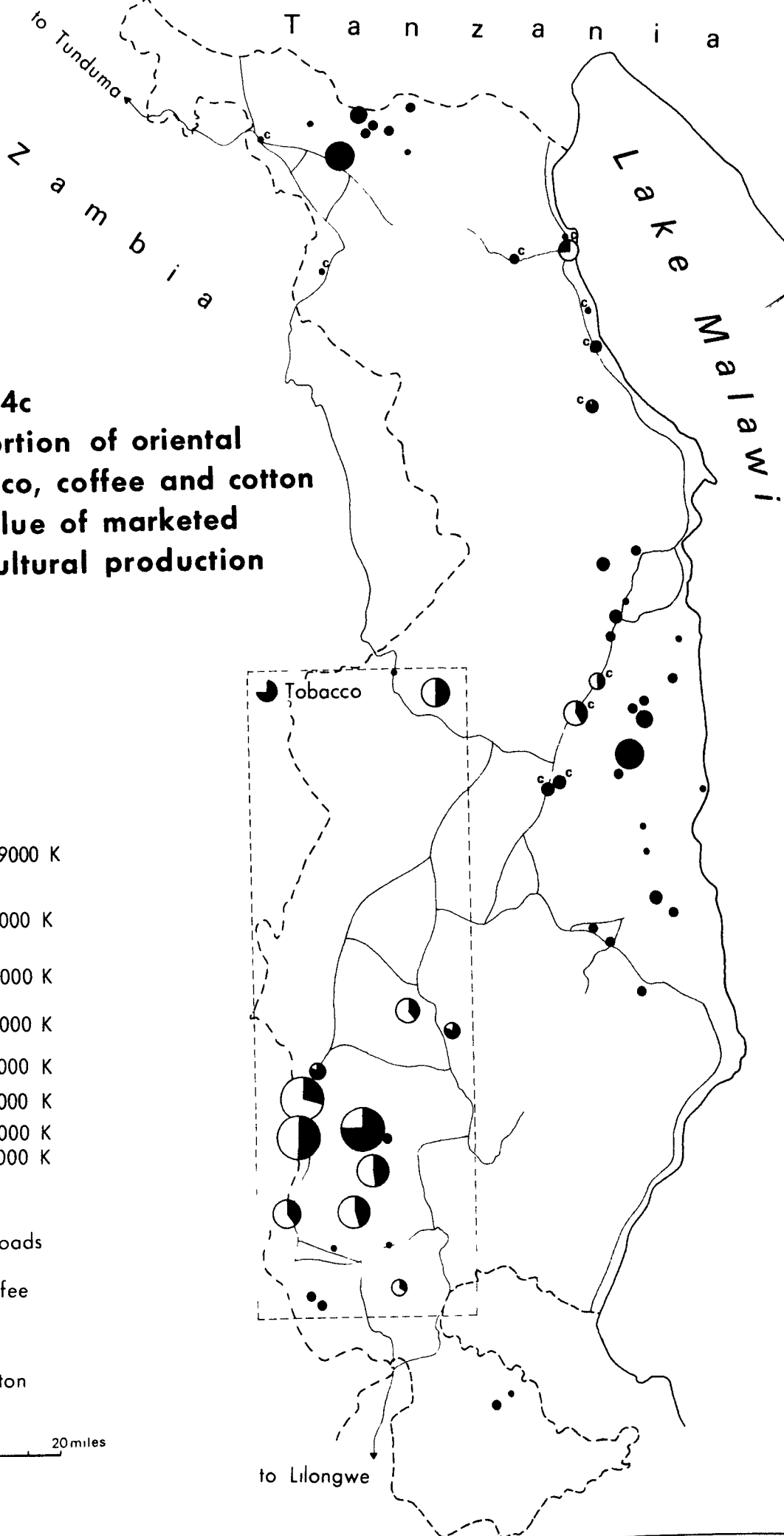


Table 9

Northern Region, value (K) of marketed agricultural production per crop; the contribution of each marketed crop to the total value (%); the contribution of the districts to the value of each crop and to the total marketed value (%), 1971/72.

marketed crops	marketed (K)	value %	percentage of the districts per marketed crop				
			Chitipa	Karonga	Rumphi	Mzimba	Nkhata-Bay
rice	503,308	55.1	-	76.6	-	★	23.4
ground-nuts	160,887	17.5	0.8	1.1	3.7	94.2	0.2
maize	94,112	10.3	9.6	-	35.4	45.9	9.1
tobacco	58,606	6.4	-	-	10.9	89.1	-
coffee	45,317	4.9	33.7	-	48.6	5.1	12.6
pulses	30,587	3.4	5.1	-	43.9	51.0	★
cotton	17,159	1.8	0.7	49.7	28.4	21.2	-
ninde	1,193	0.2	-	-	-	100.0	-
tea	1,099	0.2	-	-	-	-	100.0
other	1,099	0.2	27.9	-	33.6	37.7	0.8
all marketed produce	913,367	100.0	3.0	43.4	9.4	29.6	14.6

Source: ADMARC, SCA, STA, Ministry of Agriculture.

★ < 0.5 %

Karonga therefore occupies a relatively favourable position, whereas the Chitipa district is found at the lower end of the scale, since - apart from some coffee growing in the Misuku Hills - commercial agriculture is almost non-existent. (map 3)

Commercialisation of smallholder agriculture in the Northern Region has taken various forms: the establishment of settlement schemes in unoccupied areas, the introduction of commercial crops on existing farms under the guidance of the general extension service, special crop programmes by specialised authorities such as those for coffee and tea, and agricultural projects.

At present, there are 7 settlement schemes in the Northern Region which can be distinguished into 2 types, viz. the wet land rice schemes and the dry land schemes. The rice schemes are Hara, Kaporo-Mwenitete and Wovwe in the Karonga Lakeshore Plain, and Limphasa in the Nkhata Bay Lowlands. Particulars are given in the table below:

Table 10
Particulars of wet land rice settlement schemes.

name of scheme	year of starting	no of settlers in 1972	cultivable acreage '72	marketed [★] output 71/72 sh. tons
Hara	1968	314	470	1142
Kapora-Mw.	1969	81	180	230
Wovwe	1970	187	290	408
Limphasa	1969	280	540	567

★ The marketed output 1971/72 is not comparable with the number of settlers and the cultivable acreage as not all settlers cultivated the acreage available to them. Furthermore, in 1972 Hara and Wovwe were double cropping irrigation schemes, Limphasa a single cropping irrigation scheme and Kaporo-Mwenitete a single cropping rainfed scheme.

The cultivable acreage per farmer in the rice schemes varies between 1.5 and 2 acres with the exception of Mwenitete. Here 2.5-3 acres per farmer is available. The acreage put under crop is, however, unknown. In the period 1968-1971 the rice schemes gradually increased the number of settlers and their acreages.

The dry land schemes comprise Nkhozho and Thulwe in Rumphi district and Mubangwe in Mzimba district. The following details can be given:

Table 11
Particulars of dry land settlement schemes.

name of scheme	year of starting	no of settlers in 1972	cultivable acreage '72	marketed output [★] sh. tons 71/72
Mubangwe	1972/73	122	-	-
Thulwe	1971/72	135	950	-
Nkhozho	1969	148	1000	burley tob. 21 maize 192 groundnuts 8 pulses 3

★ See note table 10.

In these dry land schemes the size of the holding per settler varies between 8 and 15 acres, of which 2 acres is planted with burley tobacco. Other crops cultivated comprise maize, groundnuts and beans. It is intended to expand the Mubangwe scheme to 186 settlers and a total of 2000 acres.

In the whole region, about 1267 settlers and 3,430 acres were covered by the settlement schemes (1972). In the 1971/72 season no less than 18.8% of the value of marketed produce by smallholders in the Northern Region originated from these schemes.

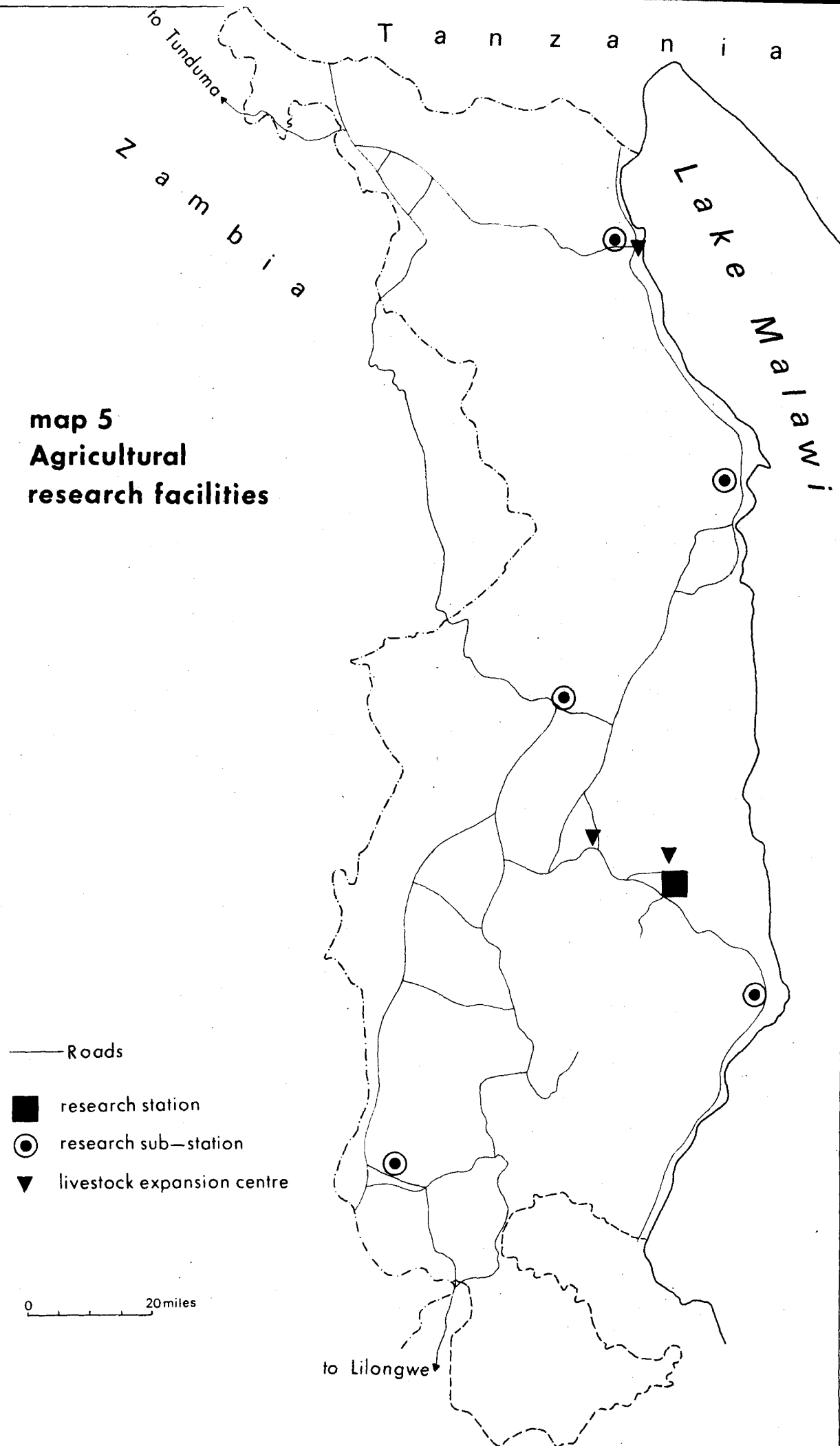
The Smallholder Tea Authority (S.T.A. North) and the Smallholder Coffee Authority (S.C.A.) provide a combination of crop-specialised services in certain areas. These services comprehend research, local verification, extension, supply of inputs, credit and marketing. In 1974 the S.C.A. was dissolved, and its task is presently being undertaken by Admarc for the processing, transport and marketing aspects, and by the Ministry of Agriculture for the extension activities.

In addition, integrated agricultural projects have been set up in already cultivated areas. The West Mzimba Land Utilization Project aims at an integration of arable cropping and animal husbandry. It intends to let the farmer make maximum use of potential dambo grazing land, at the same time preventing overstocking. The project started in 1967-68 as a self-help project in order to settle boundary disputes on arable and grazing land. Assisted by British aid, the government supported the project by soil conservation programmes, extension services and the supply of short term credit for hybrid maize seed, and fertilizers. In 1972, the self-help activities covered 107 smallholders and 1725 acres. The project will ultimately expand to cover an area of 40,000 acres inhabited by some 1700 farm families.

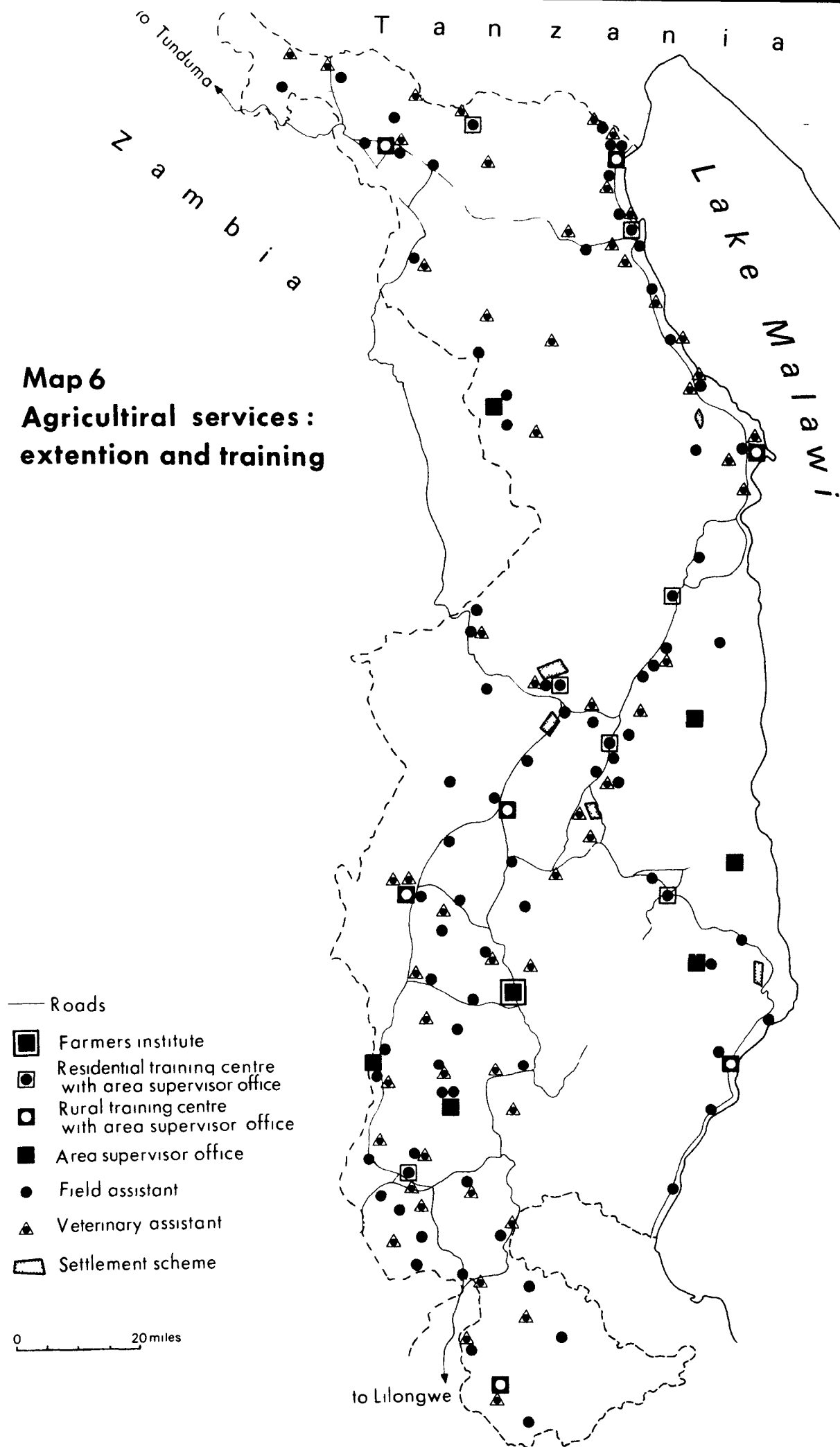
Another integrated agricultural project is the Karonga Rural Development Project, which started in the districts of Karonga and Chitipa in 1972. This I.D.A. aided project aims within its 5-years investment period to increase crop production in Karonga district and hence incomes from Malawi's foreign exchange earnings. Furthermore the project aims to increase livestock production in the Karonga and Chipita districts, both as a boost to the internal meat supply of the country and to provide better living opportunities for the population of the area. If the project proves to be successful, it will be followed by a later project. As regards crop production the project activity comprises the establishment of two double-cropped irrigated rice schemes (Ngerenge, Wovwe II). A total of 831 farmers will be settled on 1,500 acres. Additional settlement schemes involving a total of 6,000 acres of improved rainfed rice will accommodate another 2,000 farmers. Moreover, in the central part of the Karonga Lakeshore Area, agricultural projects with a total of 7,800 acres will be developed. In these areas 1,750 farmers can be accommodated. Cotton, maize and groundnuts are the main crops. The roughly 4,600 farmers ultimately involved in the various projects will be provided with medium-term and short-term credit in kind, as well as with land conservation and land consolidation programmes. Crop extraction roads will be constructed in the scheme areas and extension activities intensified. As for livestock, a demonstration ranch will be developed. A total of 22 diptanks and 4 additional cattlemarkets are under construction in the Karonga and Chitipa districts. Finally, the project covers a number of non-agricultural services. In the present phase the hospitals at Karonga, Chilumba and Kaporo will be expanded and modernised. Four dispensaries will be constructed as well as a mobile clinic. Lake Service facilities will be improved. A jetty has already been built at Chilumba, and another is under construction at Chipoka.

Services provided for smallholders cover research and local verification, marketing facilities, crop extraction roads, extension and education, and farm inputs and credit. The agricultural services are mainly provided via the Ministry of Agriculture (research, inputs, extension

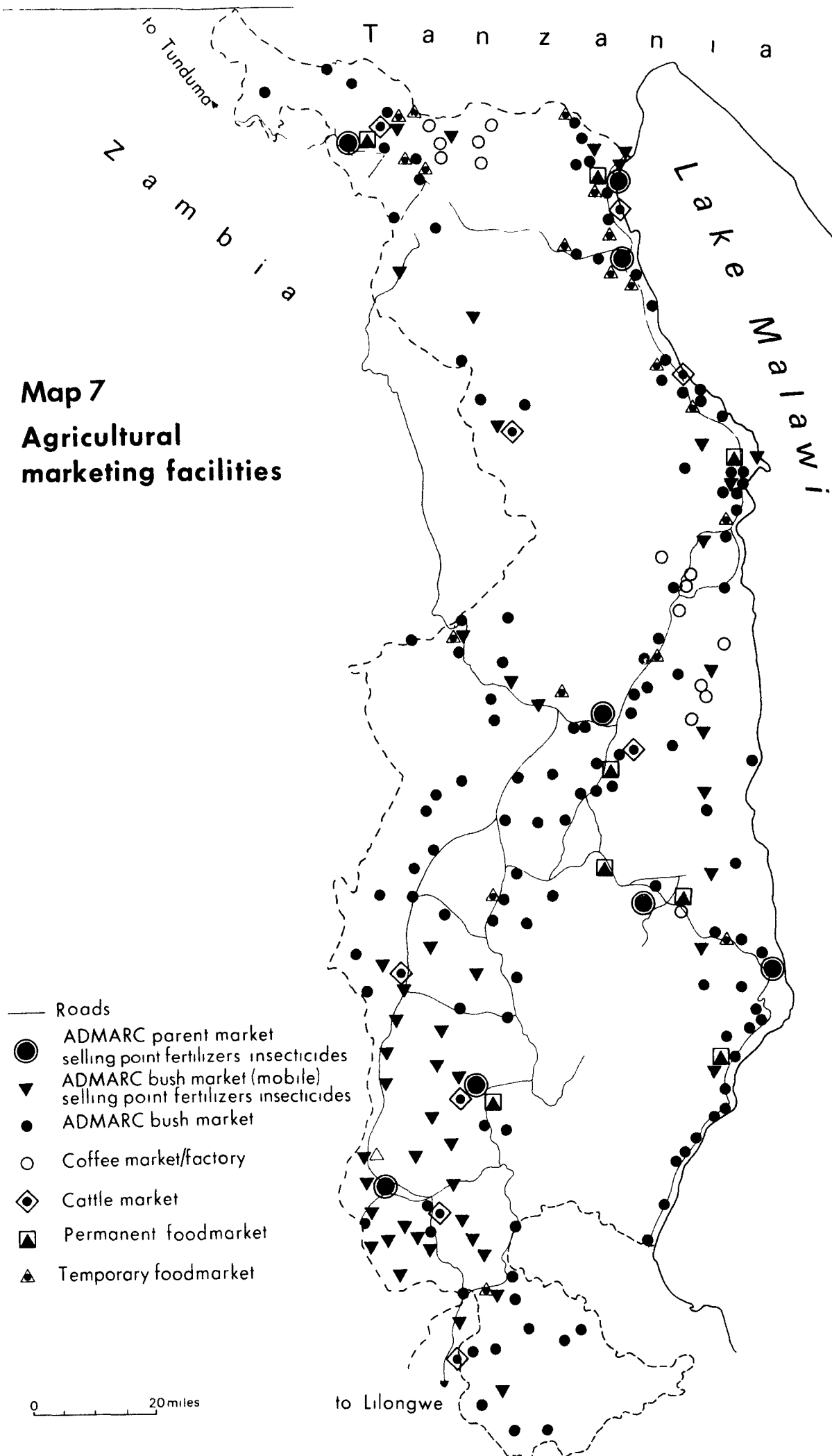
map 5
Agricultural
research facilities



Map 6
Agricultural services:
extention and training



Map 7
Agricultural
marketing facilities



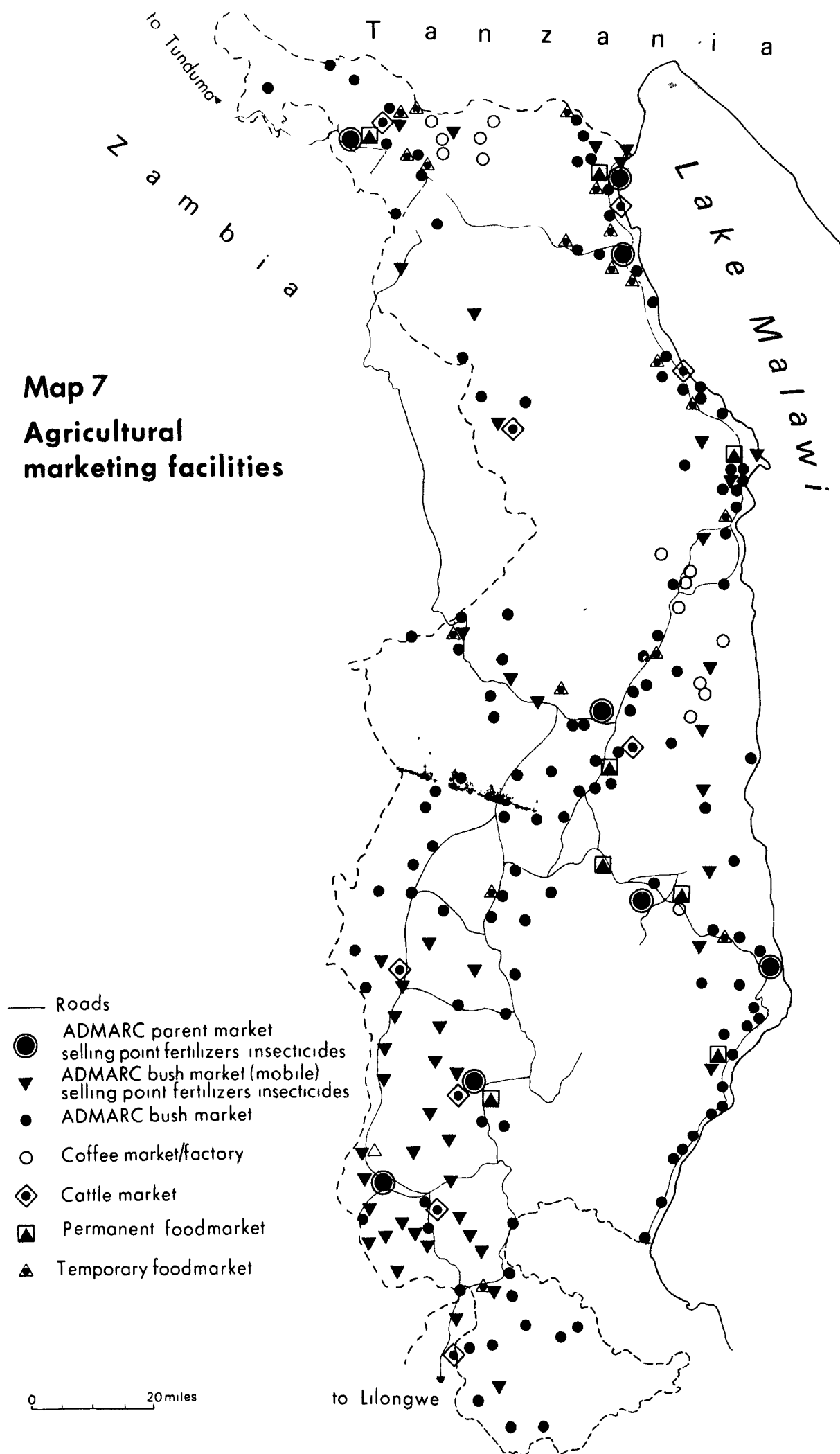
and education) and Admarc (marketing, transport, inputs). There are marked internal differences in various parts of the region, and for various types of growers, as regards access to the services listed. (See map 5,6 and 7). In the settlement schemes and the agricultural projects a more or less integrated package of inputs is provided for the smallholders. This also applies to the S.T.A. The farmers on customary land only receive extension advice, usually unaccompanied by the supply of inputs. Nor are credit facilities available to them.

In addition to smallholder agriculture, there are three estates in the Northern Region. Two of them, the Chombe Tea Estate and the Vizara Rubber Estate are privately owned; the Vipya Tung Estates are operated by Admarc, which has also started a Macademia-Project at Mzenga. All these estates take care of elementary processing in (small) estate factories. The Chombe Tea Estate covers a cultivated area of 603 acres (1972) and employs up to 850 labourers, of whom 200 are more or less permanent. The Vizara Rubber Estate has a total acreage of 4,000; 800 acres are under rubber with a monthly production of 5,000 lbs. (1972). For 1977 a planted acreage of 2,000 is planned. In the Vipya Tung Estates, the area under tung amounts to 2,000 acres. The annual output of tungoil is 300 sh. ton. Up to 800 labourers are casually employed. Besides the Admarc Seed Farm at Ekwendeni (150 casual labourers) there are a limited number of large privately-owned farms, mainly in Mzimba and Rumphu districts, usually also called estates. These farms produce burley tobacco and work on a tenant basis. This system implies that the land is supplied by the owner and on it the tenant grows the required cash crop and his own food. The acreage issued to each tenant differs from person to person. The owner also supplies inputs such as tobacco seed (obtained free from the Ministry of Agriculture), insecticides, sprayers, sheds, implements and fertilizers. Sometimes the land is ploughed by tractor. In return, the tenant supplies the labour for the cash crop although some occasional labour may be provided by the owner in peak periods. The owner "buys" the crop - usually tobacco - from the tenant at a price arranged individually between owner and tenant. There are very little data available as to the returns obtained by the tenant. In general, the tenant receives 10-15 tambala per lb. whereas the owner obtains 19 tambala for good quality tobacco on the auction floor. If 2 acres are put under tobacco - which is the target - and the average yield is 450 lbs./acre, the tenant receives about K.100 per annum (900 lbs. ad. 11 t.). From this amount the supplied inputs still have to be deducted. The owners of the estates are chiefly politicians, businessmen and high-level civil servants.

Livestock (map 8).

In the Northern Region, the livestock activities have always been closely linked with smallholder agriculture. Apart from some cattle on government stations, all cattle is kept by smallholders. The average number per holding is 1.3 for the Northern Region as a whole but the differences between the various districts are substantial. The important livestock areas are South Rukuru and Kasitu River, the Karonga Lakeshore and South Chitipa. The annual increase of stock, which is estimated not to exceed 5% of the cattle population, fluctuates as a result of diseases and/or weather conditions, the latter influencing the supply of grasses. The marketing of cattle amounts to an average of about one-tenth of the annual natural increase. This indicates the low degree of commercialisation. Efforts to modernise livestock acti-

Map 7
Agricultural
marketing facilities



vities are - chiefly - directed to the raising of slaughter cattle and draught animals.

Table 12

Northern Region, cattle per holding, and number of cattle per square mile in all districts, 1971.

district	ratio cattle/ holding	ratio cattle/ sq. mile	% of holdings without cattle 1969
Chitipa	1.62	14.75	63
Karonga	1.50	23.22	64
Rumphi	0.81	5.98	84
Mzimba	1.60	26.37	71
Nkhata-Bay	0.09	1.11	98
Northern Region	1.29	16.53	75

Source: Veterinary department, N.S.S.A. '68/'69.

Forestry

Apart from some conservation areas, forestry activities are concentrated in the Vipya Pulpwood Project. This project, established in the Vipya Mountains between Mzuzu and Mzimba, was originally designed to make Malawi, in the long run, self-sufficient in timber and pulp. In 1970 a market survey showed opportunities for export as well. At present the project already contributes significantly to the timber supply of Malawi, with an annual output of 75,000 cub. ft. of sawn timber. In 1972 52,000 acres of pulpwood and 10,000 acres of timberwood were planted. By 1980 another 2,000 acres of pulpwood and an additional 5,000 acres of timber will have been planted. Before this date large-scale cutting for pulpwood production will have started. A pulpmill is planned, with a capacity of 50,000 sh. tons of pulp in 1980. The mill will employ about 600 people, and the plantation scheme some 7,000.

Fishery

Fishery is restricted to some fishing grounds around the Likoma Islands and along the Nkhata-Bay and South Karonga Lakeshore. These grounds are relatively small owing to the absence of sufficient shallow water. Most of the catches are used for home consumption; surpluses are sold by fish traders in the foodmarkets throughout the region. In the case of the Likoma Islands particularly, but also in some lakeshore areas, fishery forms the main means of existence. At present, there is no research or extension directed towards improving fishing techniques in the region.

2.2.2. Other economic activities

In comparison with agricultural production and related services, the other economic activities are relatively insignificant both in terms of employment and output.

Manufacturing industries are restricted to the initial processing of export crops such as tea, coffee, ninde, tung, rice and cotton. In addition, there is some manufacturing (timber sawmill and brick making) and quarrying for, mostly local, construction activities. Only a few hundred persons are employed by these manufacturing industries.

Table 13

Manufacturing and quarrying in the Northern Region, 1971

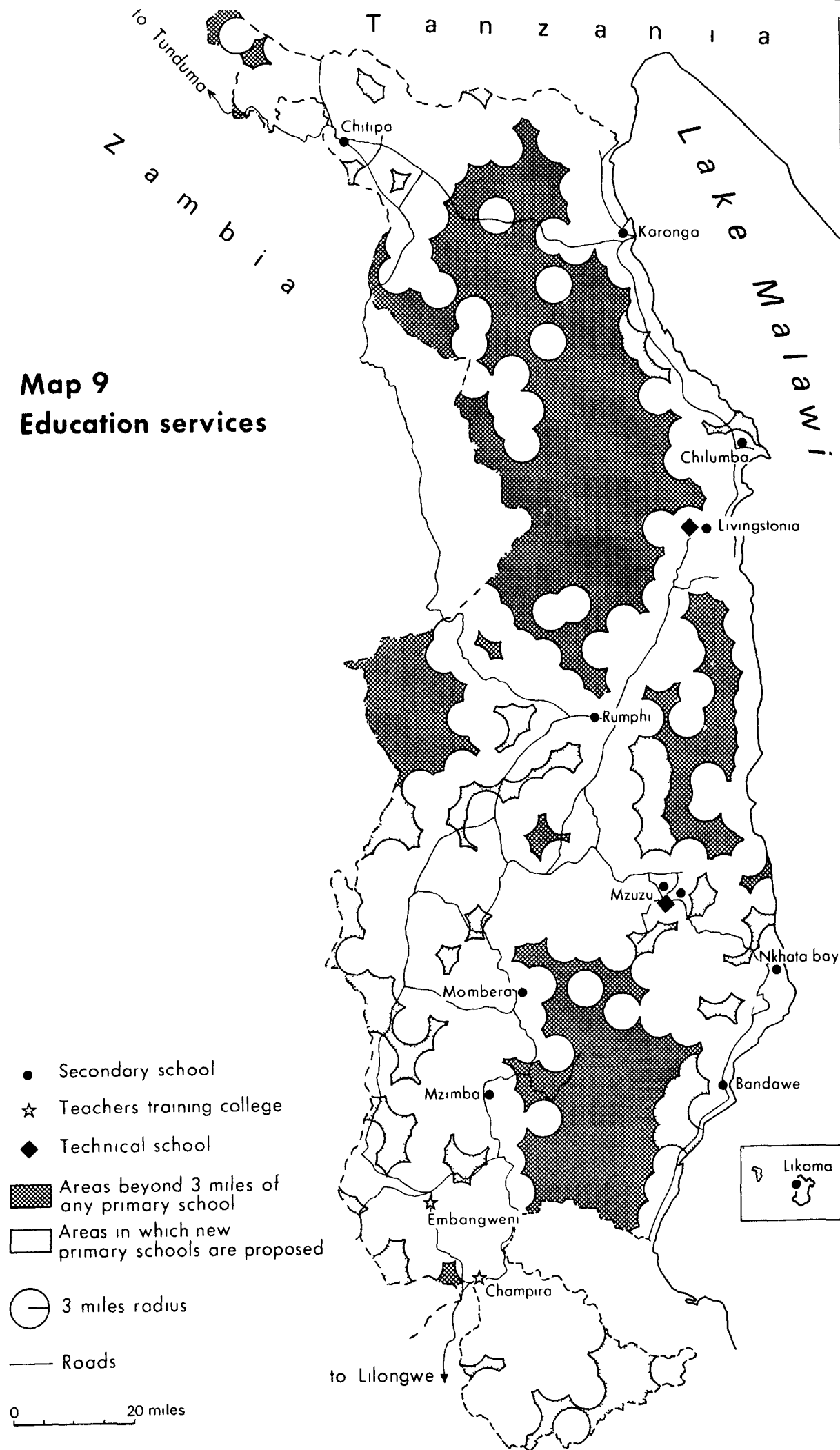
Name & type of establishment	location	input 1971	output 1971
Maxwell Cotton Ginnery	Ngara(Karonga)	159 sh.t. cotton	
NOIL rice mill	Chilumba	900 sh.t. rice	
V.T.E. tung factory	Mzuzu	750 sh.t. nuts	300 sh.t. oil
Brick & Tyle work	Mzuzu		252,000 bricks
Ninde factory (Agr.Res. Station)	Mbawa(Mzimba)	20 sh.t. ninde flowers	
Chombe tea factory	Chombe(N.Bay)	356 sh.t. green	
V.P.P. sawmill	Chikangawa(N.Bay)	260,000 cub ^{leaf} ft. lumber	75,000 cub.ft sawn timber
Vizara rubber factory	Vizara(N.Bay)		30 sh.t. rubber
All coffee factories	Coffee Areas		162 sh.t.coffee
Dundudu quarry	Ekwendeni		3441 cubic yard stones

Source: personal communication

No figures are available on the number of self-employed and employees in crafts and small-scale commodity production and processing, such as maize millers, carpenters, etc. A recent survey by the Ministry of Trade, Industry and Tourism only gives names and addresses of "manufacturers" but the survey did not cover the whole of the country and no data on employment, output, capital and investment were included²⁾.

Commerce is limited to wholesale and retail trade in fixed premises and trade at food markets. There are 30 food markets in the Northern Region, at which chiefly maize flour, vegetables and dried fish are sold. The permanent ones attract many traders, whereas the non-permanent markets, situated in the smaller trading centres, are mainly visited by smallholders selling their more or less incidental surpluses. Most employment in commerce is, however, provided by retail trade in fixed premises. Including a limited number of wholesale traders, an estimated 2200 persons are employed in this sector, 20% of whom are concentrated in the urban centres. No figures are known about turnovers.

Map 9
Education services



More important in terms of employment than either manufacturing and crafts or commerce, are community services in the field of education and health. There are no fewer than 431 primary schools in the Northern Region, 70% of them government assisted, the remainder being financed by missionary organisations. In addition, one finds 12 secondary schools, all except one government assisted, 2 Teacher Training Colleges and 2 Technical Schools (see map 9)

Table 14

Northern Region. The number of schools, the percentage of assisted schools, the average number of classes per school, the average enrolment per class and the enrolment ratio, in all districts, 1972.

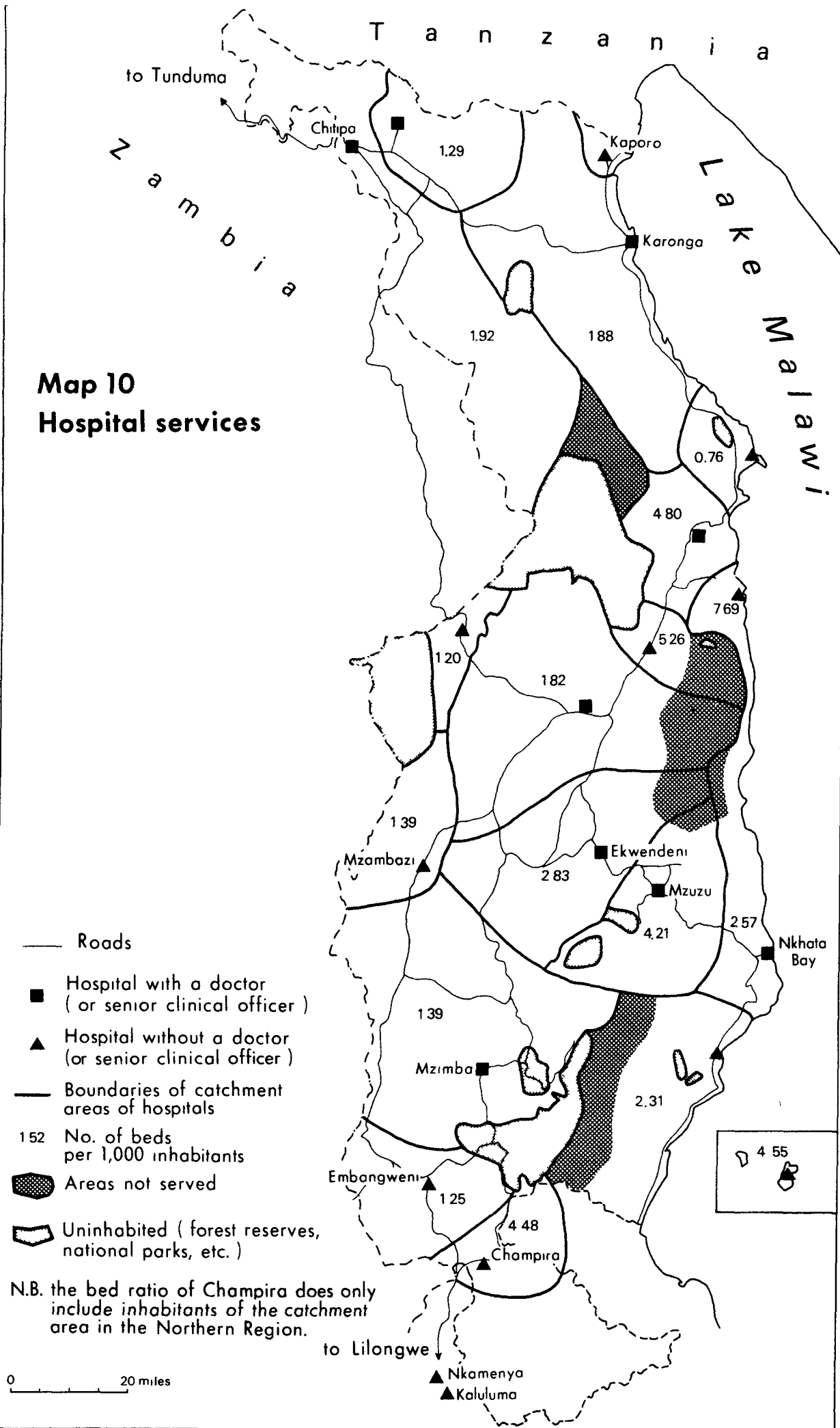
district	number of schools	% assisted	average number of classes per school			average enrolment per class	enrolment ratio
			assisted	unassisted	total		
Chitipa	56	86	8.2	5.3	7.8	28.6	79.4
Karonga	57	77	8.3	4.8	7.5	36.8	85.6
Rumphi	56	84	8.1	3.7	7.4	30.5	105.9 ^x
Mzimba	200	57	8.3	4.5	6.7	29.3	72.0
Nkhata Bay	62	77	8.1	4.8	7.3	30.4	68.1
Northern Region	431	70	8.2	4.6	7.1	30.6	77.7

Source: Ministry of Education

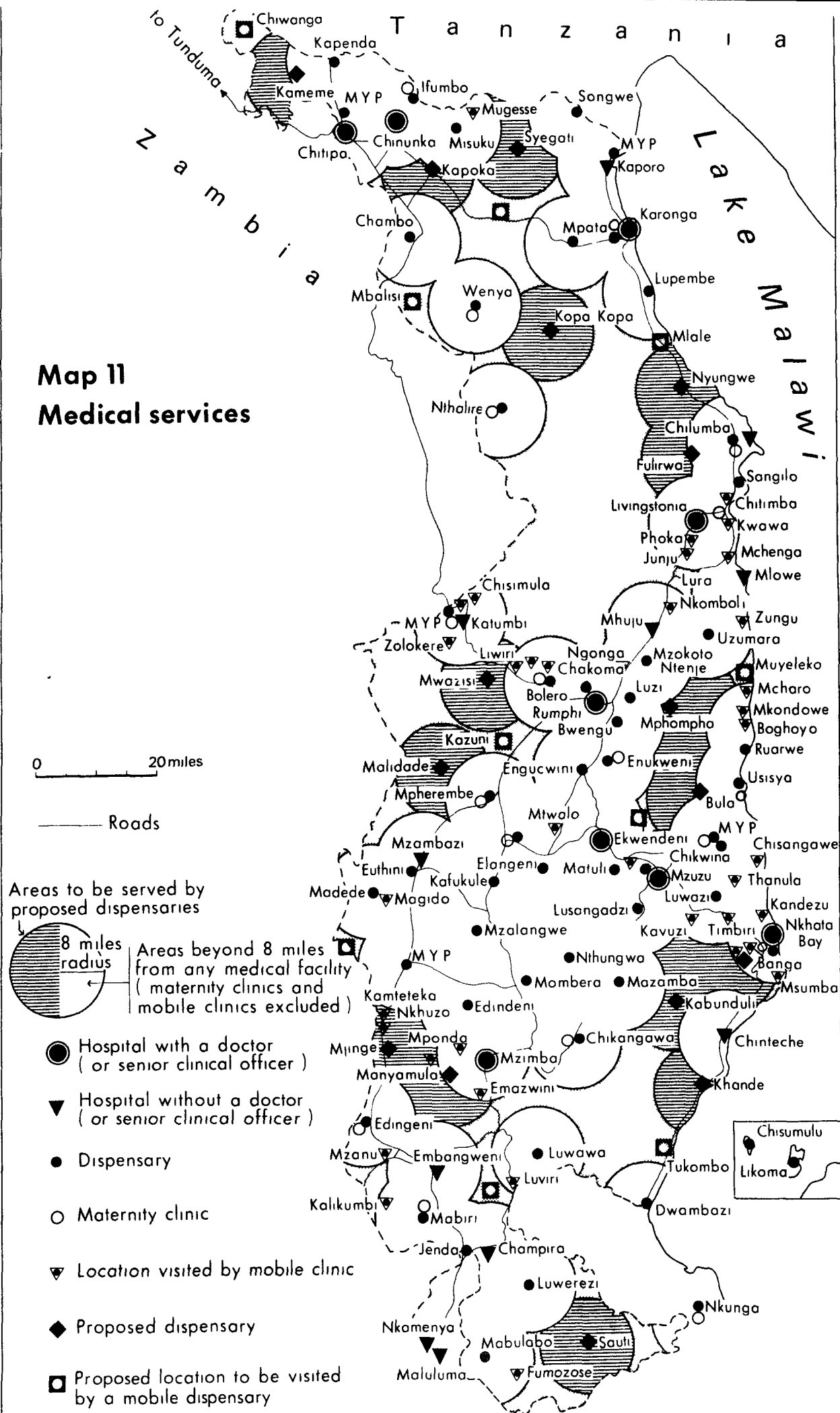
^x due to the fact that sometimes people older than those in the 6-13 age group are also attending primary school.

The Northern Region is relatively well-endowed with health facilities. In this respect a distinction should be made between (1) hospitals with a permanent doctor and (2) hospitals without a permanent doctor, both providing an in-patient type of service; (3) dispensaries providing an elementary out-patient type of medical treatment; and (4) maternity clinics, with a specialised type of treatment. In addition, there are a number of mobile clinics, generally visiting each location in its area once a week. These mobile clinics provide either a general form of medical treatment or a more specialised one, such as "under five" services or eye treatment. The specialised type is the most common. There are 19 hospitals in the Northern Region, 10 of them government financed, 46 dispensaries (32 government and 14 mission) and 20 maternity clinics (12 government and 8 mission) (see map 10 and 11). Altogether, 3,083 persons are employed in educational and medical services.

Map 10
Hospital services



Map 11
Medical services



In the transport sector only 6 companies are regularly operating services. Road passenger transport is exclusively run by one private company, freight transport by another 2 or 3 firms, while the lake transport is dominated by the Lake service of Malawi Railways. Air transport is in the hands of Air Malawi, although occasionally some charter companies are involved. In 1971, 157,000 passengers and 30,000 sh. ton goods were handled by the Lakeservice and 8,400 passengers and 120 sh. ton of freight (one quarter of this being mail) were moved by air. Figures for road transport are lacking, but since freight is brought to and from the harbours by trucks, the volume of freight transported by road will at least equal, and in all probability exceed, that of the Lake service. Passenger transport by road far outnumbers that by lake. Most consignments of freight are by and for wholesalers, who distribute manufactured products, and Admarc which organisation takes care of the marketing of agricultural products.

In spite of the potential for tourism in the Nyika and Vwaza National Parks, the Vipya Mountains and the Lakeshore beaches, the present scale of tourism is rather insignificant. There are only 7 resthouses employing about 20 people, and providing 77 beds. An eighth resthouse is located at Chelinda in the Nyika National Park. About 100 people are employed in this park. The resthouse provides only 12 beds. In addition a resthouse has recently been built at Likoma Island. It is planned to replace the destroyed resthouse at Chitipa, by a hotel, and a feasibility study is being carried out for a hotel at Mzuzu. Proposals have been made recently for the construction of a resthouse at Chinteché and a hotel south of this centre at Bandawe point at the Lake. These activities are related to the proposed Vipya pulpwood scheme. This list illustrates the limited facilities for tourism in the Northern Region.

Personal services of various types are concentrated in the urban areas, where the highest income groups are living. No further information is available about this element of the service sector.

CHAPTER 2.3.

EMPLOYMENT

The employment situation in the Northern Region has to be interpreted in the context of its production structure: a dominant smallholder agriculture and an - almost - non-existent manufacturing sector. The majority of the adult males are self-employed in smallholder agriculture. In 1972 the number of farm operators³⁾ was estimated at 166,500. In the same year 1,500 of them or 0.9% were operating within settlement schemes and agricultural projects. The total size of the working farm population⁴⁾ was about 339,200 persons⁵⁾. On somewhat larger holdings, additional employment is provided for other - neighbouring - smallholders in the form of working parties. Payments mainly take the form of food or beer.

As smallholder agriculture is largely geared to subsistence production, the average cash income/capita from marketed agricultural produce for the Northern Region as a whole amounted to a mere K 1.53 in 1971-'72. Consequently, there is an obvious need for additional sources of cash income. A similar situation exists for the fishermen. To a large degree, the sources of additional cash income are found outside the Northern Region. Many adult males look for temporary work in other parts of Malawi or abroad and remit money to relatives in the region. Unfortunately, no reliable data are available on the number of people involved in this migration, or on the average income obtained outside the region and the magnitude of the remittances to relatives and friends.

Wage employment in the region is characterised by the small size of the labour force and the high incidence of temporary employment⁶⁾: of the 13,800 employees recorded in the wet season, almost half (6,100) were regarded as temporary. The latter group chiefly consists of unskilled agricultural labourers, particularly those carrying out construction, maintenance and harvesting work in settlement schemes, in the Vipya Pulpwood Project and on the estates. (Chombe Tea Estate, Vizara Rubber Estate and the Vipya Tung Estates). In addition, one finds unskilled workers for road construction and maintenance among these temporary labourers. This explains the 24% increase in temporary wage employment during the dry season, raising the total recorded employment figure to some 15,300.

The bulk of the permanent employees are found in the tertiary sector, particularly in the medical and educational services (almost 40% of all recorded permanent employment). In addition to these community services, permanent employment is provided in, among other fields, agricultural and other government services and transport. Almost 30% of all permanently employed are unskilled.

The occupational classification of the permanently and temporarily employed shows a high incidence of agricultural and general labourers (56%), and there is also a large number of medium professional and technical workers. The latter group mainly consists of primary school teachers, medical assistants and nurses (Table 15).

Finally, the influential position of central and local government as an employer should be emphasised. Even if medical and educational services are excluded, no fewer than 61% of all permanent and temporary employed persons are working for central or local government institutions and departments. The parastatal organisations and the private employers share the remaining 39%.

The breakdown of all employed persons over the districts shows a concentration of 65% in two districts, viz. Mzimba and Nkhata-Bay. The

Table 15

Northern Region, total recorded wage employment, the number of temporary employees, the total medical and educational employment to categories of occupation, November 1971.

occupation	total number of employees	%	of which temporary employees	medical & educatio- nal empl.	% of total employment per category
high professional and technical	498	3.6		177	35.5
medium professio- nal and technical	3,333	24.1		2,460	73.8
clerical workers	630	4.5		34	5.4
craftsmen and drivers	1,497	10.9	518		
agricultural and general labourers	7,874	56.9	5,576	412*	5.2
all occupations	13,832	100.0	6,094	3,083	22.2

* including also small numbers of craftsmen

source: personal communications

Table 16

Northern Region, total recorded wage employment in all districts (numbers and %), the total population in the districts (%) and the recorded employment in the district centres (%), November 1971.

district	total number of employees	% of total employment in N.R.	% of total population (1971)	% in district centre of total district- employment
Chitipa	934	6.7	13	28.8
Karonga	1,999	14.5	15	33.1
Rumphi	1,799	13.0	9	29.7
Mzimba	5,255	38.0	46	59.7
Nkhata-Bay	3,845	27.8	17	8.8
Northern Region	13,832	100.0	100	36.4

Mzimba 13.1
Mzuzu 46.6

source: personal communications

other districts share the rest between them, with Chitipa at the lower end of the scale. No less than 36% of all recorded employment is found in the district centres and particularly in Mzuzu, the regional capital. This employment is mainly in the tertiary sector. Wage employment in the rural areas is provided by the agricultural projects and the settlement schemes. The high incidence of these schemes, projects and estates in Nkhata-bay explains this district's prominent position (Table 16).

The employment situation will change considerably as a result of the implementation of the Vipya Pulpwood Project. In future a total of 6600 persons will be employed by the project (1978), which means that permanent employment will almost be doubled.

CHAPTER 2.4.

PHYSICAL INFRASTRUCTURE

2.4.1. The transportation network

The administrative road classification used in Malawi, makes a division into Main roads, Secondary roads and District roads (see map 12). All roads are maintained by the Ministry of Works with the exception of most District roads, which are maintained by the District Councils. Since in this classification the qualitative aspects of roads are not included, we made a new classification based on the quality of the surface of the roads and the availability of bridges according to type. We distinguish:

bituminised roads: suitable for all kinds of traffic the whole year round.

all-weather roads: suitable throughout the whole year for all vehicles up to at least 15 short tons.

all-season roads: suitable throughout the whole year (except during heavy rains), though in the rainy season for vehicles up to 5 sh. tons only.

dry-weather roads: suitable for all vehicles only during the dry season; in the rainy season only for fourwheel-drive cars.

Not included in the classification are a number of roads no longer under maintenance, and the so-called crop-extraction roads which connect bush markets with the permanent road system. The pattern of the latter changes from one dry season to the other depending on local initiative and the self-help efforts of the people in an area (to prepare a track which gives access to the bushmarket at the end of the rainy season). These crop-extraction roads could, therefore, not be marked on the map. Except for the bituminised roads, all roads have an earthen surface. There are no standardised road widths.

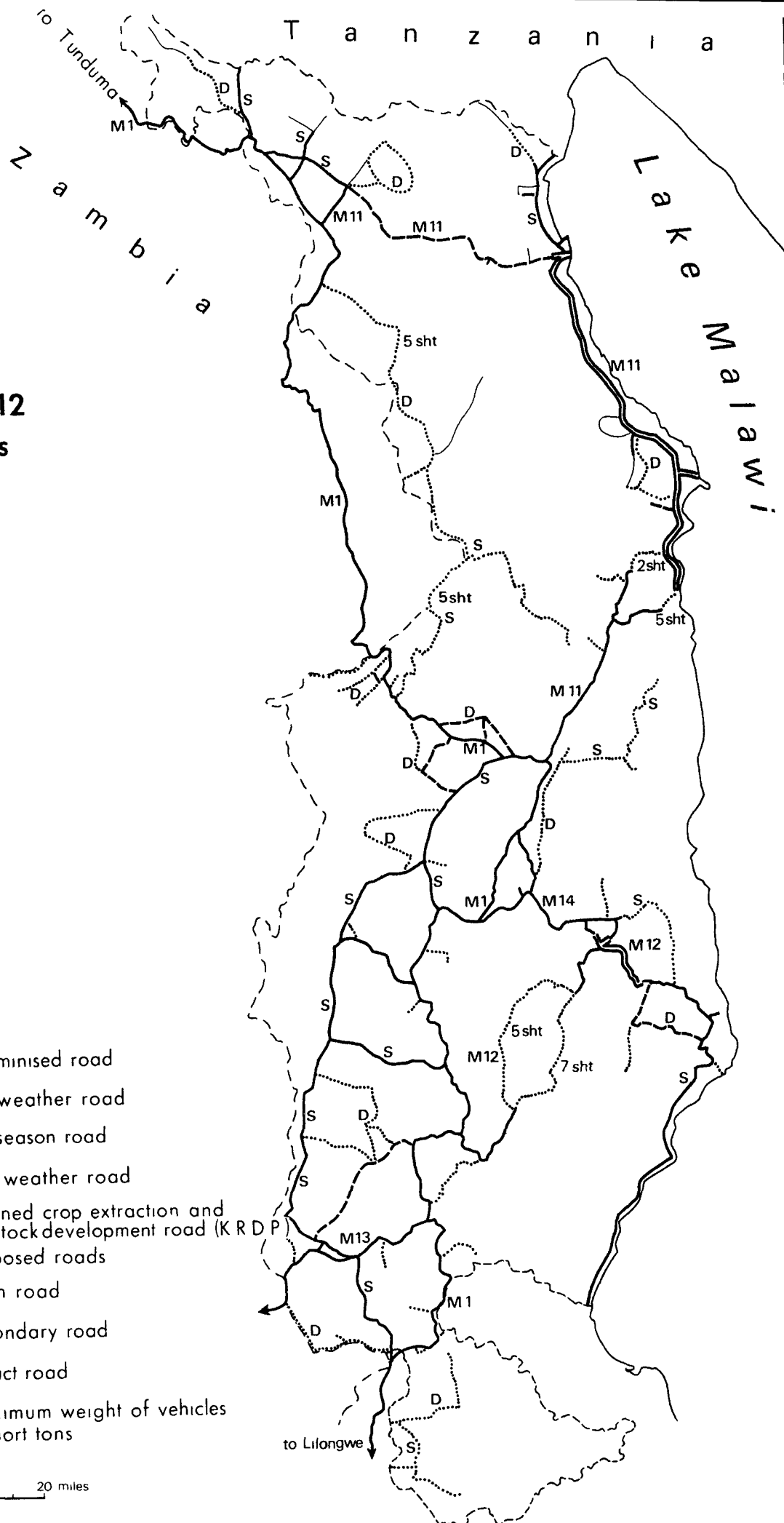
At present the Northern Region is connected with the rest of Malawi (inter-regional connections) by one road only (M₁). However, part of the Lakeshore Road is under construction in the Nkhata-Bay district. This will ultimately link up with the part of this road already constructed in Karonga. Its alignment will probably run from Nkhata Bay via Mzuzu and Rumphu to Cheweta, since in this part of the region the construction of a road along the lakeshore is highly complicated.

In 1977, an important section of the Lakeshore road, viz. Benga-Mzuzu will be completed, while in addition parts of it, e.g. the Mzuzu-Nkhata Bay section, will be bituminised by then. Another planned road which will improve inter-regional connections is a short-cut from Mzuzu to Kasungu, which will either run through the Vipya Mountains or from Ek-wendeni to Mombera. The inter-regional connections serve as intra-regional traffic arteries as well. In general the region's transport pattern is North-South directed; there are few East-West roads. This situation will be improved by the intended construction of a road from the Vipya Pulpwood plantations to the planned pulpmill at Chinteché. In addition, a preliminary survey will be undertaken to investigate the possibilities of constructing a road from Kaluluma in the Central Region, via the Mabulabo area in Mzimba district to Dwambazi (C.R.). This road may form a vital East-West connection between the M₁ and the Lakeshore

**Map 12
Roads**

- == Bituminised road
- All weather road
- - - All season road
- Dry weather road
- Planned crop extraction and livestock development road (K R D P)
- Proposed roads
- M14 Main road
- s Secondary road
- D District road
- 5 sht Maximum weight of vehicles in short tons

0 20 miles



road. Moreover, there are possibilities of upgrading the Karonga-Chitipa road. Finally, there are vague plans to improve the Chisenga-Ntalire-Chelinda road in Chitipa district.

Lake Malawi is an alternative to road transportation, and forms almost the only link with the outside world for the Likoma Islands and the area between Cheweta and Nkhata Bay. At present only Nkhata Bay has jetty facilities, but a second port is under construction at Chilumba. Of the airfields and -strips shown on map 13, only Mzuzu, Chilumba and Karonga have scheduled flights.

The bulk of passenger transportation is carried by the bus services and only a minor part by the lake service. Map 13 reflects the distribution, frequencies and all-weather characteristics of passenger transportation, showing the preponderance of the bus services. The district and regional centres are the focal points in this passenger transportation network.

Freight transportation is, except for the southern part of Mzimba district, a matter of combination of road and lake. The bulk of the freight streams is directed therefore from the countryside via the district and regional centres to the harbours of Kambwe, Chilumba, Nkhata Bay and vice versa.

2.4.2. Urbanisation and the distribution and hierarchy of service centres

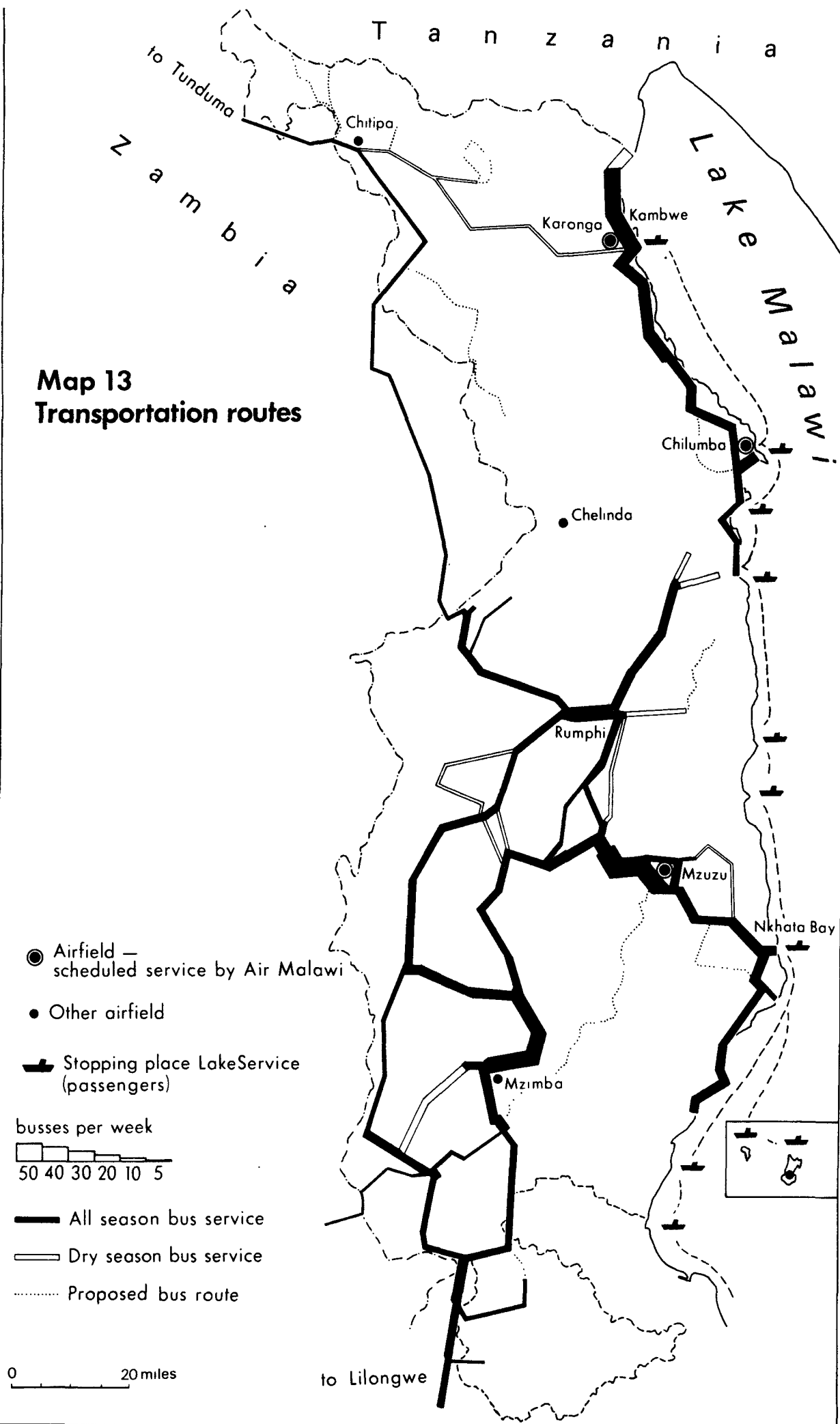
Only a tiny fraction of the Northern Region's population is living dispersed over the area; the majority is found in settlements of various size with a minimum of 40 inhabitants. Most of these clusters are bigger however; varying between 100 and 200 inhabitants in Mzimba and Rumphi districts up to sometimes over 400 in the lakeshore areas.

Some of these settlements are classified as urban, viz. those which possess certain urban characteristics. In the Northern Region which is the least urbanised part of Malawi, 7 of the total of 12 urban areas had fewer than 1000 inhabitants, in 1966. Here, only 0.8% of the region's population was living. Only 5 settlements had more than 1000 inhabitants in 1966, viz. Mzuzu (8176), Mzimba (4152), Rumphi (1892), Chitipa (1347) and Nkhata Bay (1188). None of these, however, provided, in the phrasing of the 1966 census report, "an element of urban living in the sense of persons homes and working places being within a built-up environment".

This absence of any significant urbanisation in the Northern Region should be explained in terms of the minor importance of non-agricultural production activities, the high degree of self-sufficiency in agriculture and the low general standard of living of the region's population. These phenomena also explain the high rate of out-migration which is chiefly directed to areas outside the country, South Africa in particular. Moreover, there is a movement of people from the Northern Region to both rural and urban areas in other parts of the country.

These movements can only be described in rather vague terms in view of the woeful dearth of demographic information. The country has only had one full population count and even this showed gaps for crucial aspects as fertility, mortality and economic activity. A more recent sample survey presents slightly more reliable data but only at the national level, whereas dis-aggregated data were considered of insufficient reliability. In this analysis the emphasis has not, therefore, been put on the demographic characteristics of the urban areas, and on the distribution of the working force according to type of industry in particular, but rather on an inventory of the types of services provided by centres.

Map 13
Transportation routes



Only a limited number of the settlements in the region can be identified as service centres. However, it is impossible to establish a certain minimum number of inhabitants for these settlements, since large villages may not provide a single service whereas a few small ones may provide many. Consequently, not all service centres were classified as urban in the 1966 census. However all urban areas in the census report were identified as service centres.

Various definitions of services are used. Services in the strict sense is a type of industry comprising the sub-groups of government services, community services, business services, recreation services and personal services. Sometimes other types of industry, : viz.those with a non-material output, are included in the service sector. Here, we use the wide definition: the sector covers agricultural services, public utilities, commerce, transport and communication, and services proper.

Services should not only be distinguished according to type; within each type various levels should also be distinguished. For educational services, for example, a primary school, a secondary school, and a university represent three successive levels within this type of service. For each type an establishment of a higher level is serving a greater number of people than one of a lower level. Consequently, a place providing the former will cater for a larger number of people and a larger area, than one providing the latter. However, the number of people and the area a place caters for is not only dependent on the level of service but also on the number of different types of services it provides. The centrality of a place can therefore be determined as a function of the number of types of services it provides, together with their level. Moreover, because of external economies services of a similar level tend to cluster. In this way, a hierarchy of places i.e. service centres will emerge. In developing countries in general however, and in the Northern Region of Malawi in particular, the low level of income leads to relatively little differentiation in the service apparatus. This hierarchy of service centres may therefore be little pronounced.

A hierarchical classification of service centres in the Northern Region has been made, using a point allocation and scoring system which values the centres in terms of the number and level of services they provide. The various categories of service centres coincide with the following point allocation: urban centres: 25 or more; rural market centres: 16 - 24; local centres 8 - 15 points (For details see map 14). Only those places scoring 8 points and higher are considered service centres. Consequently the large number of small clusters of services, usually providing two or three types of services of the lowest level were omitted from the classification. (see Table 17) In total 35 service centres were classified, ranging from 8 up to 41 points, in which three categories can be distinguished: urban centres, rural market centres and local centres. There are 6 centres in the first category, 2 in the second and 27 in the third. One of the urban centres, the regional capital Mzuzu, would have been more suitably classified as a regional centre, if a fourth level of services, the regional services had been added.

In all the urban centres distinguished, all types of services are present, except for banking in Chitipa. Half of the services provided are of the highest level, the majority of the others of the medium level. These urban centres were originally government administration centres, beside which, at a later stage, the community services, the agricultural services, the commercial services and the communication function became equally important. An exception should be made for Nkhata-Bay of which only the communication function (port) equals the government administration function in importance,

Map 14
Service centres

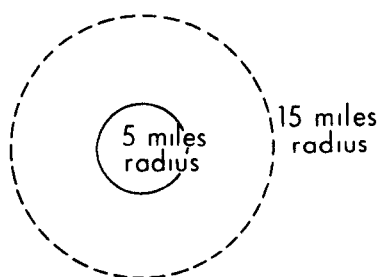
Tukombo Proposed rural market centre

Kambwe Proposed local centre

Madede Proposed additional centre

— Roads

0 20 miles



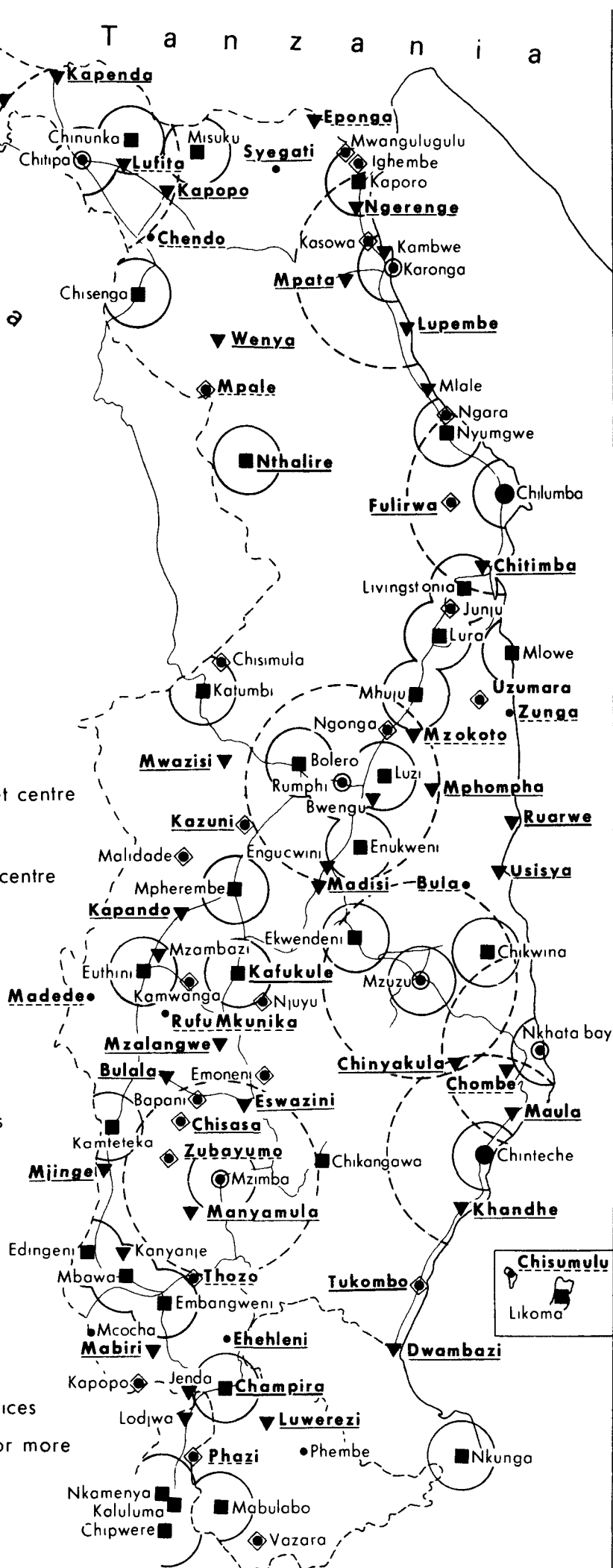
● Urban centre

● Rural market centre

■ Local centre

▼ Small cluster of services

◆ Cluster providing 3 or more key facilities



The two rural market centres provide almost all types of services: but administration and community centres are lacking in both. About half of the services are present at the medium level, the others at the lowest level. Chilumba has a strong communication function (port) next to a community function. Chinteché, a former district Boma, has an administrative and a communication function. This will change considerably in the near future. The planned pulpmill, and other industries the mill may attract, will add a dominant industrial function and strengthen the other functions of this centre.

In the local centres some 80% of the services provided are of the lowest level, though all but six provide one or more services of the medium or highest level as well. In almost all local centres administrative services, police, community services and hotels/resthouses are absent, whereas justice, education and health, agricultural extension and marketing services, water and electricity, public transport and retail trade are usually found. In general the community service, agricultural service and communication and commercial function is characteristic for local centres, in some cases together with a government administration function (chief headquarters). Livingstonia, Chinunkha, Embangweni, Champira, Mlowe and Ekwendeni have a dominant community function (missions). Mbawa (research station) has a strong agricultural service function. Chikangawa is a forestry centre and Likoma a fishery centre.

Table 17

Hierarchical classification of centres in the Northern Region

	total	administration	justice	police	education	health	agr. extension	agr. marketing	community centre	water and electricity	hotels & resthouses	public transport	banking	postal services	petrol and repair services	retail trade, etc.
URBAN CENTRES																
Karonga	37	2	3	3	2	3	3	3	2	2	2	2	2	3	2	3
Chitipa	34	2	3	3	2	3	3	3	2	2	2	2	-	3	1	3
Rumphi	36	2	3	3	2	3	3	3	3	2	2	1	1	3	2	3
Mzuzu	41	2	3	3	2	3	3	3	3	3	2	2	3	3	3	3
Mzimba	38	1	3	3	2	3	3	3	3	2	2	2	2	3	3	3
Nkhata-Bay	35	2	3	3	1	3	3	3	2	2	2	2	1	3	2	3

Table 17
continued

centre	total	administration	justice	police	education	health	agr. extension	agr. marketing	community centre	water & electricity	hotels & resthouses	public transport	banking	postal services	petrol and repair services	retail, etc.
RURAL/MARKET CENTRES																
Chilumba	18	-	1	1	2	2	2	1	-	1	1	2	-	2	1	2
Chinteché	17	-	3	1	1	2	2	1	-	-	-	1	1	2	1	2
LOCAL CENTRES																
Kaporo	12	-	-	1	1	2	2	1	-	1	-	1	-	1	-	2
Nyungwe	8	-	1	-	1	-	1	1	-	1	-	1	-	1	-	1
Misuku	8	-	1	-	1	1	2	1	-	-	-	-	-	1	-	1
Chinunkha	10	-	1	-	1	3	1	1	-	1	-	-	-	1	-	1
Chisenga	12	-	1	1	1	1	1	1	-	-	2	1	-	1	1	1
Nthalire	8	-	1	-	1	1	1	1	-	1	-	-	-	1	-	1
Livingstonia	12	-	-	-	2	3	-	1	-	2	-	-	-	2	1	1
Mlowe	8	-	1	-	1	2	-	-	1	1	-	1	-	1	-	-
Lura	11	-	1	-	1	1	2	1	1	1	-	1	-	1	-	1
Mhuju	10	-	1	1	1	2	1	1	-	1	-	1	-	1	-	1
Bolero	12	-	1	-	1	1	2	1	1	1	-	1	-	1	-	2
Katumbi	10	-	1	-	1	2	1	1	-	1	-	1	-	1	-	1
Luzi	8	-	1	-	1	1	1	1	-	1	-	-	-	1	-	1
Enukweni	9	-	1	-	1	1	1	1	-	1	-	1	-	1	-	1
Ekwendeni	14	-	1	-	1	3	-	-	1	1	-	1	1	2	-	3
Mpherembe	10	-	1	-	1	1	2	1	-	1	-	1	-	1	-	1
Kafukule	11	-	1	1	1	1	-	1	-	1	-	1	1	2	-	1
Euthini	13	-	1	-	1	1	2	1	-	1	-	1	1	2	-	2
Kamteteka	8	-	-	-	1	-	1	1	-	1	-	1	1	1	-	1
Edingeni	13	1	1	-	1	1	1	1	1	1	1	1	1	1	-	1
Mbawa	8	-	-	-	1	-	2	3	-	1	-	1	-	-	-	-
Embangweni	13	-	-	-	1	2	1	1	-	1	-	1	1	2	1	2
Champira	12	-	1	1	1	2	-	1	-	1	-	1	1	2	-	1
Mabulabo	10	-	1	-	1	1	2	1	-	1	-	1	-	1	-	1
Chikangawa	8	-	1	-	1	1	-	-	2	-	-	1	1	1	-	-
Chikwina	9	-	1	-	1	1	2	1	-	1	-	1	-	1	-	-
Likoma	13	-	1	-	2	2	1	-	-	-	2	2	-	2	-	1

Table 17
continued

Local centres in the Central Region providing services to the Northern Region

Nkhunga	10	-	1	-	1	1	2	1	-	-	-	1	-	2	-	1
Nkhamenya	9	-	-	-	2	2	-	1	-	1	-	1	-	-	-	2
Kaluluma	8	-	1	-	-	2	2	-	-	1	1	1	-	-	-	-
Chipwere	10	-	-	-	1	-	1	2	-	1	-	1	-	1	1	2

Source: personal communication

- 1) National Sample Survey of Agriculture, 1968/69, Zomba, Sept. 1972, p. 11.
- 2) Ministry of Trade , Industry and Tourism, Small-scale Industry for Malawi, mimeo, February 1973, p. 15.
- 3) Farm operator: a member of the household who cultivates one or more gardens and who has a right to the produce of the land.
- 4) Working farm population: those members of the farm population over ten years of age who work on the holding.
- 5) The figures are estimates, based on the ratio between total population 1966, on the one hand, and the number of farm operators and working population given in the N.S.S.A., on the other. Population growth was assumed to be 2.5% per annum and the ratio was kept constant.
- 6) Temporary employment comprises here all employment with a seasonal character and employment on a piece-work basis. (daily paid labourers are not necessarily temporary labourers).

PART 3 THE NORTHERN REGION:
AN ANALYSIS OF BOTTLENECKS

CHAPTER 3.1.

THE RESOURCES

The Northern Region's possibilities for development and the course this process may take are to a large extent determined by the region's natural resources. However, the variety of these resources is rather limited; under the present conditions the best possibilities are for agriculture and stock-breeding. In addition, there are good possibilities for forestry. Fishing grounds in Lake Malawi are too small to allow sizeable production increases, economically exploitable minerals are lacking. The possibilities for the use of natural waterpower are unknown. Thus production increases and a rise in incomes have to be based on agricultural and livestock activities, supplemented by forestry. The resources for agricultural and livestock development are limited to less than half of the region's land area. The largest part of the region is unsuitable for agricultural use, viz. the areas are covered by the shallow and stony lithosols. In the remaining part, the soil qualities vary considerably. The dry western plains are covered by sandy and weak ferralitic soils of moderate to low fertility. Good yields of arable crops can only be obtained through the use of manure and fertilizers. The ferrisols in the eastern scarp zones suffer from erosion and acidity. The water-logged soils in the dambo areas can only be cultivated if drainage improvements are present. The most fertile soils in the region are the alluvial soils, which are mainly present in the Karonga Lakeshore area. These soils sometimes suffer from impeded drainage if impermeable layers occur in the subsoil.

In view of the limited availability of reliable demographic data, particularly those on fertility, mortality and migration, any figures or estimates on urban growth rates have to be taken with a pinch of salt. In this report, the national population growth rate of 2.5% has been taken from the census report and a similar rate has been adopted for the Northern Region. For the latter area, this figure is in all probability too high in view of the high rate of labour migration and the long-existing tendency towards a southward movement of people within the country. It is, however, clearly the Malawi Government's intention to increase the monetary incomes in the Northern Region and to keep the people on the land. In view of this objective, and in the absence of any more accurate figures, the national growth rate has been adopted for the region, which implies an estimated total population of 621,000 in 1975, 703,000 in 1980 and 795,000 in 1985.

In the field of human resources, migration is the most striking phenomenon. The effect of out-migration on the development of the region is not easy to determine. This is to a large extent due to the lack of information about the consequences for the agricultural activities of the absence of a large proportion of the active men. On the one hand, the out-migration reduces the labour force, and may thus hamper the introduction and expansion of new crops which require more labour at certain peak periods of the year. On the other hand, migrants remit money to their home areas, part of which may be saved for investment in agricultural development. As regards this latter aspect, again insufficient information is available. The remittances are at least

partly used for, often conspicuous, consumption. In that case, migration certainly does not contribute to the long-term development of the Northern Region. Recent research in West Africa, however, suggests a generally negative result for the labour-supplying areas and considerable benefits for the labour-receiving areas. In other words the two other regions of Malawi, and particularly some other countries in Southern Africa, profit from the Northern Region's export of labour.

Qualitative aspects of the human resources may form substantial bottlenecks for development. Broadly speaking two factors influence the quality of the labour force, and therefore its productivity, viz. the general health conditions and the level of education and skills functional for the type of production activities. The lack of data in this field again prevents a more detailed analysis. In general, health conditions are unfavourable as a result of the climate, the presence of tropical diseases and the food situation. Educational activities and skills instrumental to the improvement of agriculture are insufficiently available.

The labour migration phenomenon in particular, which is largely directed to opportunities abroad, heavily influences the rate of urbanisation in the region. At the present level of urbanisation in the Northern Region, the urban areas chiefly have to increase their populations by means of in-migration. Two factors generally determine the rate of migration to urban areas: the difference in wage level between the rural and the urban areas and the probability of obtaining urban employment. The type of migrant has to be taken into account as well. Three types of non-locally born persons may be distinguished in the towns: the educated, usually government officers who do not migrate spontaneously but are transferred by their ministries; the skilled craftsmen and primary-school leavers; and the unskilled workers. The growth of the urban areas in the Northern Region is primarily dependent on the expansion of government activities and consequently on the increasing numbers of government officers. Their establishment may subsequently lead to a slight increase in the two other types of migrants, through the rise in local employment opportunities for drivers, clerks, petty traders and service workers. The skilled and unskilled workers of the Northern Region chiefly migrate abroad, however, and also to the Southern and Central Region. Not because wage levels in the urban areas are not significantly higher than those in the rural areas, but primarily as a result of an almost complete absence of employment opportunities in the urban areas at the present low level of urbanisation.

The rate of increase of the urban population in Malawi is arbitrarily set at 6% for the larger towns such as Mzuzu, and 5% for the smaller ones. Such figures seem to bear very little relation to the actual circumstances. It is evident that there are sizeable differences in growth rates between the various towns in the country. Lilongwe undoubtedly shows a very high rate of growth as a result of its establishment as the new capital. Both Blantyre and Zomba will show lower growth rates but their absolute increase will in all probability exceed those of other towns. In the Northern Region Mzuzu as the regional capital will show the highest population growth rate, with the exception of Chinteché, the centre of the Vipya Pulpwood Scheme. Apart from Chinteché, reliable estimates for the increase of the population of the urban areas are hard to make. Moreover, the Chinteché

example shows that developments in this field are closely related to the government's programmes in the sector of primary production activities. The Vipya Pulpwood Scheme is the only project in the Northern Region which involves a large and spectacular expansion of the wage labour force. Other programmes aiming at the improvement of income conditions refer to the commercialisation of agriculture, chiefly on existing holdings. This will primarily result in a moderate growth for the smaller type of service centre.¹

Consequently, the population increase in the Northern Region will to a large extent have to be absorbed by the exploitation of the agricultural and livestock resources of the region. In order to trace population pressure on the land we made population projections and compared those with the acreage of cultivable land still available, and the required acreage per person.

Table 18

Acreage of land required to accomodate the region's population up to 1985; acreage under cultivation in 1969 and estimated acreage of unused cultivable land.

districts	Chitipa	Karonga	Nkhata-Bay	Rumphi	Mzimba	regional total
Projected population in:						
1970	65,699	85,751	92,621	51,477	253,583	549,131
1975	74,332	97,019	104,791	58,241	286,904	621,287
1980	84,195	109,761	118,555	65,890	324,586	702,978
1985	95,149	124,176	134,124	74,543	367,213	795,205
Total number of holdings, 1969 +)	14,400	16,800	24,000	9,300	52,600	97,100
Average size of a holding, 1969 ¹⁾ acres	2.9	3.5	1.5	3.3	4.7	3.5
Average number of persons per holding in 1969 +)	4.5	4.4	4.6	4.5	3.9	4.3
Total acreage required to accomodate increased population in						
1975	48,000	77,175	34,162	42,749	344,285	503,242
1980	54,300	87,400	38,649	48,373	389,503	569,412
1985	61,400	98,800	43,724	54,715	440,656	644,116
Total acreage under cultivation in 1969+)	41,100	58,900	36,800	30,300	245,200	412,300
Estimated total acreage unused cultivable land, 1965++)	336,900	190,100	245,200	305,700	1525,800	2603,700

Source: +) N.S.S.A. 1968/69

++) Malawi Crop Potentials 1965-1985 Ministry of Agriculture and Natural Resources

Note: 1 In Nkhata-Bay district, the total acreage required to accommodate the increased population in 1975 is smaller than the acreage under cultivation in 1969. This is due to a defect in the N.S.S.A. 1968/69.

2 Horizontal and vertical additions of the total acreage required to accommodate the increased population in 1975, 1980 and 1985 differ because the district and regional figures on average size of holding and average number of persons per holding as given in the N.S.S.A. do not agree.

One may conclude from this comparison that land shortages for the region as a whole will not occur in the near future, even if the whole natural increase of population were to be absorbed into agriculture. At present it is only locally, viz. in some parts of the Karonga Lakeshore and South Mzimba, that all cultivable land has already been put under cultivation. In this calculation it has been assumed that cropping patterns techniques, productivity, etc. would remain unchanged which is doubtful if development programmes in agriculture are implemented. But both with and without these programmes land shortages for the region as a whole will not constitute a serious problem.

CHAPTER 3.2.

PRODUCTION PROBLEMS

3.2.1. Agriculture and agricultural services, and forestry.

The analysis of agricultural problems in the Northern Region focuses on smallholder agriculture. This section of the agricultural sector constitutes the backbone of the region's economy and provides employment and a living for more than 90% of the region's total population. Smallholder agriculture is characterised by low yields per acre and a production almost entirely used for home consumption. Improvement of techniques and expansion of the production for the market is, therefore, urgently required.

The low yields in smallholder agriculture are a result of the low level of crop husbandry, i.e. the varieties used, the absence of fertilizers, pesticides and insecticides, and the non-availability of farm implements. The main factors behind the high degree of self-sufficiency are the farmer's giving priority to his own food supply, influenced by a lack of confidence that food will be obtainable in periods of shortage and at reasonable prices, and the lack of commercial crops sufficiently remunerative to make the farmer abandon part of his self-sufficiency.

Expansion of agricultural production may take place through an increase in the production of existing crops and the introduction of new crops. For both, insight is needed into the present state of the factors of production. Land is in abundant supply. At present, only 13.5% of all land suitable for cultivation is in use. There are, however, substantial differences in the quality and the potential of the land in terms of soil nutrients, slope and the capacity to retain water. This will influence the choice of the crops and the priorities for taking unused land into cultivation. We have no information as to the distribution of land over the population but in all probability land does not form a major constraint in raising production, as almost all land in the rural areas of the region is held under customary tenure, and sufficient unused land is still available. In this respect the Northern Region contrasts with other parts of Malawi.

Nor does labour seem to create a major bottleneck. Although there is a woeful dearth of information on labour input in smallholder agriculture, recent surveys in the Mbawa area, which is fairly representative for large parts of the Northern Region, indicate that the average number of working hours for farm work per year varies between 900 and 1300 hours for both the male and female heads of household and the wives.²⁾ The generally low labour input is in all probability closely related to the insufficiently attractive prices offered to the farmers for the major cash crops.

The situation is quite different when we come to capital and the farmer's ability to combine the various production factors to achieve a much higher output and productivity. At present, the farmers' monetary incomes are very low and they are entirely needed for their basic consumption needs. Consequently the farmers have no chance of saving and thus of investing in their farms, even assuming that they are motivated to expand their production because of good marketing prospects. The introduction of high yielding varieties, the applica-

tion of fertilizers, pesticides and insecticides, and the use of improved farm implements will lead to a higher standard of crop husbandry and to higher outputs. These measures require, however, the fulfillment of certain preconditions and at the same time put high demands on the agricultural services.

Nor is the livestock situation any less gloomy. Although a large number of cattle are found in the Northern Region, the quality leaves much to be desired. Cattle are mainly kept for their social value, i.e. they play a crucial role in the important events of social life such as marriage and death. The quality of the cattle is influenced unfavourably by the lack of good breeding stock, the high incidence of diseases, and the lack of good grazing land - partly caused by overgrazing in some areas - and fodder crops. The marketing opportunities for cattle have recently been improved. Marketing operations by the Cold Storage Company and by local butchers have stimulated an awareness of the economic value of cattle. Nevertheless, most farmers do not go beyond occasional sales, in particular when additional cash income is required for school fees and for purchasing additional food when the harvest has failed.

The establishment of settlement schemes is aimed at creating growth points of high productivity which, it is hoped, will at the same time function as stimulants for surrounding smallholders. In the Northern Region all settlement schemes and most agricultural projects are characterised by a single crop approach, i.e. in the rice schemes and the tea project the farmers only grow rice and tea. Only in the burley tobacco schemes the farmers grow some food crops in addition to the commercial crop. The smallholders in schemes and projects achieve considerably higher yields per acre than smallholders on customary land. Although the rice schemes cover only about 1300 acres, they nevertheless contribute 30% of the total marketed quantity of rice. However, only small numbers of farmers are involved and most of them have gardens outside the schemes, in order to satisfy their own food requirements. The establishment and development of the existing settlement schemes is the result of large-scale concentrated investments. The schemes' contribution to a general rise in agricultural productivity in the region is however questionable. Although the demonstration effect of the Limphasa settlement scheme (Nkhata-Bay district) stimulated rice growing in the dambo's outside the scheme, that of the burley tobacco schemes in Rumphu and Mzimba districts is negligible, as smallholders outside the scheme are not allowed to grow this crop. Tea is not grown outside the project, either. Moreover, the stimulating function of schemes and projects is rather limited since the conditions of smallholder agriculture within the schemes differ considerably from the conditions outside. Whereas the participants in the schemes and projects receive integrated assistance in the form of a package of inputs, all the smallholders outside the schemes and projects get is some occasional advice, usually without the additional supply of inputs.

Raising agricultural production on smallholder farms either by the introduction of new crops or by improving the existing ones requires a wide variety of external inputs. These inputs include research, improved varieties, fertilizers, pesticides and insecticides, agricultural credit and marketing facilities.

As for research, a distinction has to be made between basic agro-technical research and agro-economic research. At present the various (sub-) research stations co-ordinated from the regional headquarters at Lunyangwa, near Mzuzu, concentrate their efforts on agro-technical research, in the fields of variety trials of food and cash crops, livestock and crop rotation. The experiments have been highly successful, especially with regard to maize, tobacco, cotton and groundnuts. The research findings are subsequently communicated to the smallholders through the agricultural extension organisation. The acceptance of the results of the research on the part of the farmer depends on the economic advantages to be gained. To gauge these advantages, it is necessary to have, on the one hand information on the costs of the advised improvements, especially in terms of the additional labour inputs required, and on the other, data on the present farm situation. The latter aspect is handled by the Agro-Economic Survey of the Ministry of Agriculture, but for the Northern Region data collection is still in its initial phase. Surveys have only been carried out for Mbawa, Karonga North, the Hara Irrigation Scheme, the Chisasa tobacco growers and the Mphompha coffee growers. At present surveys are being undertaken in the Henga valley and the Bulambya Plain (Chitipa district) adjacent to the Misuku Hills. For large parts of the region no detailed agro-economic information is available. Data as to size of holdings, cropping pattern, labour input and yields are particularly lacking. Both the agricultural research division and the extension service implement verification trials throughout the region. These trials are, however, usually carried out on farms run by the extension officers themselves, who, because of their standard of education and monetary income from outside agriculture, are hardly comparable with the average farmer of the Northern Region.

The introduction of new crops and/or crop varieties results in a need for seeds, fertilizers, insecticides and farm implements. In the Northern Region both the agricultural extension service and Admarc supply these farm inputs. An initial problem is that these farm inputs are supplied on cash terms only. Moreover, the number of selling points is far too small and shows a strong spatial concentration. In 1971/72 there were only about 60 selling points for farm inputs (all of them at Admarc markets); and of these three-fifths were situated in Mzimba district. In addition, for those farmers close to the selling points and interested in using the inputs, a major problem seems to be that of irregular supply. In 1974 extension officers and coffee growers expressed their concern at the non-availability of fertilizers and insecticides, reportedly due to the dissolution of the S.C.A. and problems of supply, including transport on the part of Admarc. Moreover, a serious brake on agricultural production increases in all parts of the country is the dramatic rise in world fertilizer prices, coupled with the partial removal of the Malawi Government subsidy, resulting in a 110% price increase for compound phosphatic nitrogenous fertilizer and a 52% increase for

sulphate of ammonia between 1970 and 1973. Consequently, fertilizer sales went down by some 20% between 1971/72 and 1972/73, although the major development projects such as the Karonga Rural Development Project experienced no decline. This may indicate that under proper crop husbandry conditions, fertilizer is still an economically viable input for certain crops. An evaluation of the measures carried out in these projects should provide further information in this respect. As the agricultural (and additional) incomes are low in the region, many smallholders are not able to pay cash for the necessary farm inputs. Credit facilities are essential for ensuring the increasing use of modern farm inputs. At present, credit facilities for smallholders chiefly concern medium-term credit with a range of three years. This type of credit is provided to purchase farm carts, ploughs, oxen, etc. Only a tiny number of smallholders use this credit since most of them cannot cross the threshold of solvency required. Moreover, a completely different type of credit is needed by most farmers, viz. that for improved seeds and fertilizers. The absence of such a short-term credit forms a major bottleneck to agricultural development. Some short-term credit is already provided, viz. that by Admarc for seeds, insecticides and sprayers; this is, however, only available to cotton and oriental tobacco producing smallholders, selected by the agricultural extension service.

The introduction of new crops and improved varieties of existing crops has to be accompanied by expert advice as to the proper production methods and techniques. This advice is provided by the extension service of the Ministry of Agriculture. To this end, the service operates one farmers' institute where courses are given for advanced smallholders, seven residential training centres and seven rural training centres. Outside the training centres, field assistants and development assistants visit the farmers on their holdings to advise on agricultural practices.

The agricultural extension service is faced with a number of serious problems in performing its task. First, the shortage of data on the existing farming systems hampers it in giving proper advice. Moreover, only a relatively small number of extension staff are available in the region. At present there is only one extension worker per 1500 farmers, which implies that only a minor fraction of the farmers are visited regularly. To add to this, the staff is distributed irregularly over the region, the ratio per district varying from 770 to 3,700 farmers per extension worker.³⁾ The average for the country as a whole is 1 field extension staff for 470 farm families (1971). A further increase in the field staff is expected and the Northern Region's arrears may be seen as a sufficiently compelling reason to post a relative high number of newly trained extension staff to this region. The most serious obstacle, however, is the absence of a number of essentials requirements which have to be met before the extension worker can operate successfully. These essentials include the local availability of supplies and equipment, markets for farm products and production incentives for farmers.⁴⁾ In many areas where extension workers operate, these essentials have not been realised. One may wonder whether working under these conditions does not lead to frustration for both the farmer and the extension worker.

The production incentives are particularly important. If the farmer lacks the certainty that his produce will be purchased regularly and

at a remunerative price, he will hesitate to accept new varieties and to make cash costs for increasing his production. Under the farmer's present weak economic and financial conditions he hesitates to take risks, and stable prices, guaranteed for a number of years, should be considered a major incentive.

In the Northern Region, Admarc is responsible for the purchasing of most crops from the farmers. Only burley tobacco, and tea have their own marketing channels. The criteria for opening a new Admarc bush market are: the existence of a crop extraction road and a minimal potential quantity for marketing, which is generally fixed at 200 bags/market season (1 bag = 160 lbs.). Every year Admarc decides whether a certain market will be opened that season or not. This uncertainty on the part of the smallholders seriously hampers an increase in market production.⁵⁾ Except for south-west and central Mzimba district, hardly anything has been done to develop a network of crop extraction roads in the region. The absence of such roads inhibits the establishment of markets. On the other hand, smallholders can scarcely be expected to willingly construct crop extraction roads as self-help projects if they have no guarantee that a market will be opened after the road has been made. The absence of proper roads also complicates the supply of farm inputs.

The above mentioned facilities, i.e. (1) agro-technical and agro-economic research and local verification (2) farm inputs such as improved seeds, fertilizers, insecticides and farm implements (3) credit for farm inputs (4) extension and education (5) marketing facilities and (6) a transportation network, together with (7) a stimulating price policy constitute a set of external inputs for the development of smallholder agriculture. The absence or inadequacy of any of the elements seriously weakens the total effect. In the Chisasa area the expansion of smallholder tobacco growing was hampered by the lack of credit for potential tobacco growers and by ineffective extension services, although substantial sums of money were made available to establish nurseries and to develop water supply. The package of inputs offered to the farmers clearly showed an unbalanced composition. In the Northern Region as a whole, the credit facilities and the crop extraction roads, in particular, are weakly developed. In addition, there is a considerable spatial variation in the availability of agricultural services from district to district.

The Vipya Pulpwood Project forms an important addition to the agro-economy of the Northern Region. At present, employment is provided for 2,000 - 3,000 labourers, who seasonally work at the Project. In the near future, the economic importance of the Vipya Pulpwood Project will strongly increase. The acreage under forest will be considerably expanded. To establish and maintain the new plantations a labour force of 6000 workers will be required, which implies employment for an additional 3000-4000 workers. In addition, another 600 people will be employed on the mill, to be sited at Chinteché. When the large-scale cutting of pulpwood starts in 1980, roads will be needed to transport the wood to Lake Malawi. The necessary road

construction may improve access to the Kabunduli area in Nkhata Bay district. This - isolated - area has good potential for agricultural development. This and other areas surrounding the Pulpwood project could provide the food required by the workers employed in the project.

3.2.2. Other sectors of the economy

The non-agricultural sectors of the Northern Region's economy are relatively insignificant. The absence of manufacturing industries has to be explained in terms of the lack of natural resources, low purchasing power of the region's population and the poor communication network. Agricultural production is chiefly geared to self-sufficiency, and the limited quantity of commercial production is processed outside the region. An exception must be made for the initial processing of coffee, rice, tung, tea, ninde and wood, which find their economic justification either in the perishable nature of the products or in a strong decrease of weight with subsequent advantages for transportation. A further point is that natural resources for the processing of non-agricultural goods are non-existent. In addition, the extremely low cash incomes severely limit the demand for manufactured consumer goods. The quantities sold within the region do not justify the establishment of any modern industry for consumer goods, while communication lines to markets outside the region are long and of rather poor quality. For several years now the Malawi government has shown interest in the development of small-scale industries. The arguments usually brought forward in favour of these industries are: (1) more efficient resource use; (2) an increase in entrepreneurial and managerial capacities; (3) an increase in employment and capital accumulation; (4) a more efficient use of credit; (5) a better geographical distribution of manufacturing industries and (6) an increase in foreign exchange earnings. 6) Most of these arguments apply to medium - and large-scale industries as well, but since small-scale industries are characterised by lower levels of capital and labour per unit, the establishment of such industries is expected to be less complicated. Probably more characteristic for small-scale industries is the limited use of inorganic energy, the low rate of capital input in relation to labour, including a less intensive use of mechanical devices, a limited functional specialisation of the labour force, absence of standardisation and mass production and the scale of at least part of the production on order.

The major question to be dealt with here is: what are the prospects for the establishment and expansion of small-scale industries, perhaps better called petty commodity production, in the Northern Region. The Ministry of Trade report lists the following constraints: "..... the lack of organisational and managerial skills, and related to this the lack of availability of short and long term finance." 7) Without questioning the validity of these factors, it should be emphasized that the absence of demand for the products of these industries is the basic constraint. 8) In the Northern Region the absence of demand is a direct result of the prevailing low income levels and the consequent low standards of living. Monetary incomes are to a large extent obtained through labour migration and partly spent on items with a high demonstration value not produced by local manufacturing industries. Under such conditions the provision of credit and the develop-

ment of managerial and organisational skill will have little effect.

The low income level together with the poor communication network are also the main limiting factors for the expansion of tertiary activities. Only those government activities which are provided free, such as certain community services, are not governed by these factors. But public utilities, commerce and construction activities are, though not completely absent in other areas, concentrated in those areas where average incomes are slightly higher than elsewhere as a result of commercialisation of agriculture, the remittances of migrants and the presence of opportunities for paid employment. In addition, transportation activities are limited by the small size of the monetary sector in the Northern Region. The development of tourism is seriously hampered by the absence of spectacular and attractive game, adequate facilities up to international standards and, again, by long and poor communication lines.

CHAPTER 3.3.

EMPLOYMENT

The characteristics of the sectors of production bear heavily on the employment situation. The low degree of commercialisation of agriculture and the small size of the non-agricultural sector restrict the opportunities for paid employment. The overwhelming majority of the population is self-employed. The ample availability of cultivable land allows for expansion of the number of self-employed farmers but offers little scope for increasing monetary incomes if other inputs are not made available. The out-migration to other parts of Malawi and to other countries in Southern Africa originates in the low expectation of improving one's standard of living by staying in the region. A considerable improvement in the employment situation will result from the expansion of the Vipya pulpwood project and the establishment of a pulpmill. This single project will directly almost double the number of permanent wage labourers, and will in addition favourably affect employment opportunities in other sectors of the economy, notably commerce, petty commodity production and transport, but also services and food crop production.

The low degree of commercialisation of agriculture affects the employment opportunities in other sectors of the economy, too, notably in commerce, petty commodity production and construction.

For government-financed service types of activities, there is a less direct link with the commercialisation of agriculture and the improvement of the income situation. The government may expand its service apparatus in the field of agricultural services, health and education apart from any increase in productivity and income in the agricultural sector. However, employment opportunities in the government-financed service sector will generally require a higher standard of formal education. Moreover, even a sizeable expansion of this sector will not create sufficient opportunities for paid employment to bring about a substantial improvement in the region's employment situation. What this adds up to is that the improvement of smallholder agriculture is a necessary pre-condition for any long term increase in employment opportunities.

CHAPTER 3.4.

SOCIAL AND PHYSICAL INFRASTRUCTURE

3.4.1. Education and health

Apart from agricultural services, it is the community services in the field of education and health that are considered of primary importance by the Malawi government, and indeed by most African governments. These community services can be analysed in terms of two different aspects, i.e. their nature and their spatial distribution. The question of the nature of education involves the curriculum and its functionality for the types of production activities prevailing in the area. The question whether the curriculum of the primary schools in the Northern Region is geared to the agricultural conditions of the region or whether it functions as a preparation for secondary education is certainly worth investigating. This matter is, however, outside the scope of the present analysis, which focuses on the spatial aspects of education and health facilities.

An important objective of the Malawi government is to spread primary education facilities among as many people as possible. Primary schools should therefore be available within 3 miles of every settlement; in sparsely populated areas, however, this distance may have to be increased. To investigate whether the present pattern of schools in the region meets this objective, circles with a 3 miles radius were drawn round each school (map 9). This map reveals that parts of the unserved area coincide with the unpopulated parts of the region, but in other parts the present coverage appears to be insufficient, even if, because of sparse population, the radius was doubled.

The lack of schools in the latter areas contrasts sharply with some overconcentration in other areas. This phenomenon has to be explained in terms of the lack of coordination in establishing schools between mission organisations and District Councils. The effect is an under-utilisation of the total capacity in the Northern Region i.e. 30.6 pupils per class compared to the maximum capacity of 40. This under-utilisation also results from the relatively high school fees (K. 3.00 per annum) in relation to monetary income (an average of K. 1.53 per capita from marketed agricultural production although remittances from migrants may form an additional source). Finally the low priority parents possibly attach to the education of their daughters and the enlisting of children in production activities at an early age may partly explain the under-utilisation of existing education capacity. The national objective for the enrolment ratio is 50.0% of all children; in the Northern Region this is already 77.7%. This means that the Northern Region may not place a heavy demand on Malawi's resources in locating new schools in unserved areas before achieving a more regular distribution in other areas. A more efficient use of the present volume of facilities deserves priority. In the Northern Region, but even more so in other parts of Malawi, the demand for trained manpower for higher administrative, teaching and technically skilled posts is greatly increasing. This demand cannot be satisfied because of the very inadequate capacities at existing secondary, teachers training and technical schools.

The limited financial resources inhibit the improvement of health conditions. They also explain the emphasis on a general

improvement of living conditions and the giving of priority to a curative approach rather than to a preventive one. The first aspect implies, for the Northern Region, an improved food supply and food crop production, better housing, etc. And as to the second aspect, the government intends to achieve its objective in the field of health care by establishing a network of dispensaries located in such a way that each settlement is within 8 miles of a dispensary. These dispensaries will primarily have a curative task but they will gradually shift their attention to more preventive activities. Moreover, the government aims to expand hospital facilities to 2.00 beds per 1,000 inhabitants. The catchment areas of the hospitals, based on the number of beds, their accessibility, the area's topography and its population distribution, have been indicated on map 10. The high ratio for the Northern Region as a whole is mainly caused by an abundance of facilities in N.W. Rumphu, while some other areas are below the national objective. This again points to an uneven spatial distribution of facilities. Since however, large investments are made in these hospitals, the existing situation cannot be solved by simply shifting facilities.

To analyse whether the present pattern of dispensaries in the Northern Region meets the objective, circles with an 8 miles' radius were drawn from all dispensaries and hospitals (since hospitals provide this lower level service as well). Again a few unserved areas can be distinguished, some of which are uninhabited. Elsewhere a number of areas with an over-concentration of facilities are found, which should again be explained in terms of a lack of coordination between the various agencies involved (missions, Ministry of Health, District Councils, see map 11).

A more even distribution does, however, not automatically result in a proper functioning of the present system. Mission organisations charge fees for their treatment whereas most government facilities are free of charge. This forces many people with low incomes to travel long distances to government facilities although a mission facility may be found in the direct vicinity. The Government therefore feels obliged to duplicate existing mission facilities in order to provide free medical treatment for its citizens. In some cases people with higher incomes travel to mission facilities (hospitals in this case) because they are less crowded and treatment is expected to be better.

3.4.2. The transportation network

An adequate transportation system is vital to the Northern Region's development. Because the region depends heavily, and will continue to do so, on the agricultural sector, the transportation system will mainly be charged with the transport of agricultural produce and inputs. Forestry and tourism activities may impose additional demands. There are however a number of factors which limit a proper functioning of the transportation system.

The rough relief forms of the Nyika Plateau, the Vipya Mountains and the related Scarp Zones influence the road pattern of the Northern Region and limit the accessibility of these areas. The resulting situation is characterised by long and complicated communication lines between the different areas in the Northern Region, with unfavourable

vourable effects on forestry development, coffee production and tourism activities in the mountainous areas.

A second factor behind the low average quality of roads in some parts of the region is the poor quality of maintenance of both road surface and bridges. The Ministry of Works, but more often the District Councils, lack the money to repair bridges or maintain the surface. Consequently some roads can hardly be used by motorised traffic. The long, narrow shape of both the Northern Region and Malawi as a whole contributed to a North-South direction of the road pattern and a neglect of East-West connections. At present the old North-South route, the M1, is being upgraded and a new one, the Lakeshore Road is under construction. However, East-West connections are vital for feeding and supporting the lake transport as a major element in the region's transportation system. There are only two East-West roads: the Chitipa - Karonga Road and the Mzuzu - Nkhata-Bay Road, both of rather poor quality.

Another important factor contributing to the Northern Region's weak transportation system is its low degree of agricultural commercialisation and volume of surpluses. On the other hand it must be remembered that a weak transportation system implies an unfavourable transportation cost structure which in turn limits the possibilities for commercialisation. The longer the distance to Liwonde; i.e. the gathering point of export crops, in the Southern Region, the larger the produce's added value should be to cover the transportation costs.⁹ Since Admarc pays uniform prices all over the country this is not felt by the individual smallholder but it is important to the economy as a whole. These high transportation costs strongly limit the range of crops which can be economically cultivated in the Northern Region.

Moreover in some areas, particularly large parts of Chitipa and the extreme western part of Mzimba, the road pattern is inadequate to the agricultural potential of the area, while in southern Nkhata-Bay this holds for both agricultural and forestry potentials.

Finally, a major problem is formed by the absence of a suitable pattern of crop extraction roads. Because of a shortage of capital, a lack of co-ordination between the agencies involved and the absence of a policy in these matters, the pattern is highly irregular and moreover, changes frequently as a result of poor maintenance. This leads to uncertainty among smallholders about the availability of market facilities in the future.

Passenger transport has a clear social function, which also includes access to services with a higher threshold. A lack of passenger transport facilities is felt in Chitipa, E. Rumphu, the Mabulabo area in Mzimba and southwestern Nkhata-Bay. The low quality of the roads, moreover, prevents an efficient connection between Karonga, Mzuzu and the rest of Malawi. The Lake transport suffers from net losses mainly caused by the inefficient use of the available ships and poor jetty facilities. The latter are being improved however (Chilumba), while with the coming of the Lakeshore Road, lake transport will withdraw from short-haul passenger traffic, except for the areas not served by roads, and will concentrate on more profitable long-haul freight traffic.

3.4.3. Service centres

The present pattern of service centres has to be analysed in terms of geographical distribution of services and service centres, centrality and hierarchy, taking into account the demand future development will place upon it. In Malawi it is generally accepted that local centres, i.e. those providing services at the lowest level, should have an average complementary region of 5 miles radius. Similarly, the optimum complementary region of a rural market centre should be 15 miles. The present geographical distribution of service centres in the Northern Region is rather uneven. The denser pattern of services corresponds with a higher degree of economic, mostly agricultural development, though communications, too, (i.e. main roads) leaves a heavy mark on it. Map 14 shows the optimum complementary regions of the local centres. Areas which are not within adequate reach of these service centres (i.e. beyond the circles of 5 miles radius) coincide partly with the more uninhabited areas such as large parts of the Vipya Mountains, the Nyika Plateau and the Scarp Zones of Chitipa and Karonga, and partly with the economically less developed areas like southern and northwestern Chitipa, central Karonga, east and southwest Rumphi, northwestern Mzimba and large parts of Nkhata-Bay. In addition southern Chitipa and northern and southern Mzimba are outside the complementary regions of rural market centres.

In addition the degree of concentration of services in service centres is low, which decreases the centrality of the service centres. A great number of individual services are scattered outside the service centres, even in those areas where the pattern is dense. This phenomenon should be explained in terms of local political pressure and low value attached to external economies on the part of government departments and private organisations alike. The weak degree of centrality, caused by both these factors, and the lack of differentiation in the service apparatus, as a consequence of the low degree of development in the Northern Region, result in a poorly developed hierarchy of service centres. In general the number of services provided by a service centre and the level of these services increases from the lowest to the highest category of centres. However almost all local centres provide not only services at the lowest level, but also one or more services at the medium level. Only half of the services provided by the rural market centres in the Northern Region are provided at the medium level whereas most others are provided at the lowest level. In addition only half of the services of the urban centres are provided at the highest level, the others being provided mostly at the medium level. All this demonstrates the poorly developed hierarchisation of service centres. Considering also the ratio between the numbers in each category, the second category has been little developed. In view of the predominance of agricultural activities in the Northern Region, agricultural services, i.e. at least three of the key facilities, were expected to be present in all centres at a level corresponding to the category of the centre. It turns out, however, that this does not apply to Ekwendeni, Mlowe, Livingstonia, Likoma and Chikangawa. The former three, situated in the little developed areas of NE Mzimba and NE Rumphi, have a one-sided community function. The reason for this must not be sought in the complete absence of agricultural services but rather

in the neglect of the advantages of the concentration of services. For the latter centres it coincides with a different type of activity in their areas, respectively fishery and forestry. Likoma has well-developed social services but those services directed to the fishery activities are almost absent. Chikangawa has a well-developed service function for the forestry project. The pattern of service centres in the Vipya forest area will, however, change completely because of the expansion of the pulpwood project. As a result of the establishment of a pulpmill at Chinteché within the framework of the Vipya Pulpwood Project, the number of inhabitants at this centre will rise considerably. It is expected that in 1980 about 5,000 people will be living at this centre. The centre will cover the area between the site of the present centre, where the mill will be constructed, and the Bandawe Mission. This development will make Chinteché the third large centre in the Northern Region in terms of population, following Mzuzu and Mzimba. Moreover, considering the services which will have to be located in this centre to serve its population and to support the industrial and forestry activities, Chinteché will raise to seven the total number of urban centres in the Northern Region by 1980. Moreover Chinteché will be the first to have achieved its status on grounds other than administrative ones. If the pulpmill is capable of attracting other (related) large-scale and small-scale industries, and/or if it is extended, it is possible that the population will rise ultimately to 17,000. In addition to Chinteché, a number of smaller centres may be developed. Map 14 shows that in 1980 Nkhata Bay will have two viable centres, viz. Mzuzu and Chinteché, in its vicinity. Its importance as a central place will decline as a result, especially with regard to services provided to the southern part of the district. However thanks to its administrative function, its ideal situation in the centre of the district and its communication function (harbour for Mzuzu and hinterland), it is unlikely that Nkhata Bay will be reduced to a rural market centre.

Although the present pattern of service centres in the Northern Region shows some deficiencies, there is a recognition that it is already well-established and can form a good starting-point for a physical framework for future development. However, up to the present moment any strategy aimed at guiding this process has been lacking.

CHAPTER 3.5.

SUMMARY OF MAJOR BOTTLENECKS

In the previous paragraphs a variety of constraints for the development of the Northern Region in the fields of resources, production and spatial structure have been discussed. In this section we will attempt to briefly summarise these constraints and to indicate their mutual relationship.

The Northern Region has a limited variety of natural resources which mainly offer opportunities for agriculture, stockbreeding and forestry. Cultivable land seems to be in abundant supply and land shortages are, except in some small areas, not expected to occur in the near future. The soils are not very fertile and fertilizers have to be applied to achieve acceptable yield levels. Since 1970, however, fertilizer prices have risen to what is for many farmers a prohibitively high level. In most parts rainfall is restricted to a limited period of the year, and the opportunities for irrigation seem to be highly limited. The possibilities for forestry are good; the government is using the opportunities in the Vipya area for a large-scale forestry project which may constitute a nucleus for autonomous development in the Northern Region. In spite of the presence of a good general survey of the region's natural resources, additional research at the meso- and micro-level is required in order to achieve a better adaptation of production activities to the opportunities offered by the natural environment.

The region's population constitutes the main asset for development. Unfortunately there is a serious lack of information on essential aspects of the demographic conditions. Very little reliable information is available on the changes and spatial movement of the population and on the factors underlying these phenomena. It is certain, however, that out-migration is a common and very important phenomenon which forms an indication of the lack of opportunities for earning a monetary income locally. In view of the long-term advantages for the areas of destination of labour migration to the detriment of the expulsion areas, measures to keep the migrants in the region would have a favourable impact on the region's and the country's overall development. The high ratio of education and health facilities in relation to the national average does not automatically imply a healthy and properly trained labour force. Other factors are of relevance as well. The food situation, about which very little is known at present, heavily influences the quality of the labour force. Moreover, it is equally unknown whether the educated people find employment in the region, and to what extent the curriculum of the schools is geared to the development of the region's resources, and to agriculture in particular.

The production structure of the Northern Region is characterised by the dominant position of the agricultural sector, which provides employment to about 90% of the working force, and a weak development of all other sectors except services. Wage labour is of little importance and the internal market for agricultural produce is almost non-existent. The agricultural sector consists to a very large extent of smallholder farms. Farmers chiefly produce for home consumption and in most areas only incidental surpluses are marketed. In a few areas farmers grow cash crops, such as rice, tobacco, tea and coffee, for export.

Agricultural productivity is low, which is mainly due to the low yield levels. Yield levels, in turn, are heavily influenced by the absence of essential inputs and, if available, by unbalanced packages provided to the farmer and their irregular supply. In other words, whereas land and labour are, at least potentially, abundant, capital and good management are scarce.

The inputs which are especially needed in the Northern Region are adaptive research and credit. The research is required to find out the advantages the farmer would have in using new varieties and other recommended inputs under the physical and economic conditions operative at the farm level. In view of the shortage of capital at the prevailing levels of monetary income, inadequate credit facilities of various types, particularly short-term credit for improved seed and fertilizers, often prevent the farmers from adopting recommended improvement programmes. The inadequacies in these fields also impede a proper functioning of the agricultural extension service; apart from the shortage of manpower and a sometimes irregular spatial distribution over the region, its effective functioning is hampered by a shortage of data about the structure and way of operating of the smallholder farm units in most areas and a lack of essential inputs to make extension advice effective. Furthermore, constraints in the field of marketing impede farmers' attempts to raise their production. Crop extraction roads are weakly developed in various parts of the region and attempts to construct these roads by means of self-help are discouraged by the lack of any certainty that the surpluses will be purchased by Admarc because the farmers may fail to offer for sale the minimum quantity required to open up a market.

The most serious constraint facing the farmer, however, is the price offered to him for his produce. Prices of export crops usually experience wide fluctuations, which are partly offset by Admarc's stabilisation policy. The general price level of these crops and Admarc's sizeable marketing margin for some of them, result in a relatively low price paid to the farmer. Uncertainty about the price in the long run, i.e. over a number of years, and the enormous risks a farmer has to take at his level of living, often do not make it worthwhile to put in the effort, especially in view of the existing safety valve of labour migration.

Production increases occurred at the government-initiated and financed settlement schemes and projects. Capital input in these improvements was substantial, whereas the number of farmers included was small. In view of the difference in conditions within and outside the schemes, the demonstration effect will be limited.

The prospects for the expansion of non-agricultural activities in the Northern Region are small. Manufacturing industries are absent because of the small size of the market, particularly as a result of the generally depressed incomes in the agricultural sector. This factor also hampers the activities in the field of commerce and petty commodity production. The growth of the chiefly government-financed service sector depends on the expansion of the budget of the various ministries and is consequently heavily determined by the returns of the export crops, the taxation of which is a major source of government finance. An exception should be made for the possibilities of developing the forestry resources of the Northern Region. The Vipya Pulpwood Project will considerably increase

employment opportunities and income.

The spatial structure of the Northern Region shows marked differences in the degree of commercialisation of agriculture and monetary income from marketed agricultural products. Although basic data are lacking, differences are not automatically synonymous with those in the general standard of living. In addition, one finds deficiencies in the transportation network, particularly with regard to the East-West connections and the crop extraction roads. Finally, there is an unequal distribution of the - generally well-available - school and health facilities.

- 1) According to Hoyle: "In terms of practical agricultural development, within a broad context of rural development strategy, several studies from Africa have shown the importance of establishing a large number of small growth centres as foci of innovation, rather than a few large and relatively isolated improvement schemes". In this connexion he refers, e.g. to the Kenya Development Plan, 1970-74 (Nairobi, 1969) and to the study by D. Siddle, Rural Development in Zambia: a spatial analysis, Journal of Modern African Studies, 8, 1970, pp. 271-284. See B.S. Hoyle (ed.), Spatial Aspects of Development, London, 1974, p.16.
- 2) Figures calculated from Agro-Economic Survey, 4th Report, Mbawa, 1971, and Agro-Economic Survey, Mbawa, A farm management survey among oriental tobacco, maize and groundnut growers in the Mbawa area in the southern part of Mzimba district, Malawi, Lilongwe 1973. The figures refer to farm work; off-farm activities were excluded. The surveys covered a period of about 11 months.
- 3) The number of smallholders per agricultural field assistant for all districts, 1972:

Chitipa district	1,420
Karonga district	1,880
Rumphi district	770
Mzimba district	1,420
Nkhata Bay district	3,700
Northern Region (total)	1,570
- 4) See A.T. Mosher, Getting Agriculture Moving, New York, 1966.
- 5) The excentric location of a bush market does not influence the price paid to the smallholder, as one uniform price is determined for the whole country.
- 6) See Ministry of Trade, Industry and Tourism, Small Scale Industry for Malawi, mimeo, February 1973, p.2.
- 7) *ibid.*, p.11
- 8) It is surprising that this factor is not explicitly stated in this respect. In the introduction to the report, the rate of growth of the domestic market is only seen as a constraining factor for existing industries and not for the establishment of new ones. In another section of the report market information is considered an important factor for the succesful development of small-scale manufacturing.
- 9) For a detailed analysis of the transport of agricultural produce in Malawi we refer to K. Quinten and J. Sterkenburg, Marketing of Smallholder Produce in Malawi, Vol. I, Agro-Economic Survey Report, Ministry of Agriculture, Lilongwe, 1975.

PART 4

PROPOSALS FOR THE DEVELOPMENT OF
THE NORTHERN REGION

CHAPTER 4.1.

TOWARDS A STRATEGY FOR THE DEVELOPMENT OF THE NORTHERN REGION.

In many African countries regional planning quite often consists of two elements. First, an economic element, in which present levels of (crop) production are estimated and percentual growth rates are worked out as targets for a certain period. Secondly, a physical element, in which plans are made for a number of separate development projects, such as a school in one place, a health centre in another and a settlement scheme in a third. In Malawi, the economic element in regional planning is notably lacking, since the country's national development strategy for the period 1971-1980 is not supplemented by a regional breakdown of national production targets. At present, the physical element constitutes the basis of regional planning in Malawi. However, without a well-devised development strategy, targets cannot adequately be established, and separate projects may fail to achieve optimal results or may even have a negative impact on the overall situation. Since this report includes certain recommendations for improving the existing situation in the Northern Region, a tentative suggestion for a development strategy for this region should be included. Another very good reason for including this section is to stimulate discussions of the topic.

A development strategy should be based on the potential of the region, on the present pattern of production, and should be in line with Malawi's national development strategy. An analysis of the Northern Region's resources reveals a limited variety of natural resources and a seemingly abundant supply of labour. Development possibilities are, at the present state of knowledge and technology, restricted to agriculture, stock-breeding and forestry. The present pattern of production shows the heavy influence the region's physical conditions. The agricultural production activities take a prominent position in terms of the percentage of the working force involved, but agriculture is characterised by a low level of crop husbandry and by production almost entirely directed to home consumption. Malawi's national development strategy gives top priority to "a general rise in agricultural productivity to be achieved quickly and effectively by the most economical means".¹⁾ The country intends to make the maximum use of land and labour and to economise on the use of capital and skills. It has opted for a two-pronged attack:

1. to provide focal growth-points in the form of high-productivity projects, such as irrigation and settlement schemes;
2. to raise the general level of productivity through extension and marketing operations.

It is assumed that the high-productivity areas have a catalytic effect on the operations of the peasant farmer in the surrounding areas.

The focal growth-point approach through settlement schemes constitutes a rather vulnerable, extremely complicated and in most cases very expensive type of development strategy. Experiences in a number of African countries have indicated this vulnerability and complexity, and the schemes' lack of success.²⁾ No assessment has been made, as yet, of this aspect of the development strategy under the conditions operative in Malawi. As for the Northern Region, no exact

figures are available on the total capital and recurrent expenditure and the amount spent per farmer involved in the schemes. Investments in the schemes for the country as a whole amounted to K 520 per acre for irrigated schemes and K 180 per acre for rainfed schemes. The number of farmers at present involved in the Northern Region is 1500, not many at all, and in fact forming only 1% of all smallholders in the region. At the present rate of implementation of the growth-point aspect of the agricultural development strategy, the schemes will not even be able to absorb the natural increase in the region's population. Moreover, the demonstration effect of the schemes is in all probability highly limited. First, the farmers in a scheme will often differ substantially in their socio-economic characteristics from those outside. Secondly, the conditions under which farmers operate in the traditional areas are much more unfavourable than those experienced by the farmers in the schemes.

Another element in the growth point approach is formed by the comprehensive regional development efforts implemented by semi-autonomous projects. In the Northern Region there is one such project viz. the Karonga Rural Development Project (K.R.D.P.). A characteristic feature of these projects are the high costs per adopting family. The K.R.D.P. involves total costs of K: 5.0 million while the target number of families adopting improved technology in the final year of the project is estimated at 25% of all families in the project area, i.e. 4,600 out of 18,000. This gives a cost per adopting family of K 1,087. This figure is the highest of all the major development projects in Malawi, although it should be added that part of the funds will be used for the construction of health facilities. The number of adopting families comprises less than 3% of the farm operators in the region, and consequently an amount of some K 100-125 million would be required to provide similar services for all parts of the region. It will be clear that any attempt of this magnitude is beyond the financial capacities of the Ministry of Agriculture, while it is also highly unlikely that foreign assistance on acceptable terms will be available on such a scale. In other words the spearhead function assigned to this type of project will not materialise, since for the same reasons as mentioned for the settlement schemes, the demonstration effect will again be highly limited.

This implies that the improvement of agriculture in the Northern Region should rather be based on the second approach: the increase of productivity through extension and marketing operations. Unfortunately, this approach received a cinderella treatment in the Statement of Development Policies, 1971-1980. Whereas the focal growth-point approach is dealt with in detail, the "broad-based attempt to raise productivity throughout the country by research, extension, conservation and the incentives of better inputs and marketing facilities" is only superficially mentioned.³⁾ In view of its importance for the development of agriculture in the Northern Region, this second approach needs to be worked out in detail. The essentials to be met if such general extension effort is to be successful have been listed by Mosher and coincide in general with the requirements mentioned in the Statement of Development Policies.⁴⁾

- production incentives for farmers;
- markets for farm products;
- transportation;
- local availability of supplies and equipment; and
- constantly changing technology.

The composition of the package made available will differ from area to area depending on the physical and human resources of the area concerned and the existing infrastructure. A first requirement, therefore is the sub-division of the Northern Region into homogeneous agricultural zones. The viability of the approach and the response of the farmers will also be highly dependent upon the Government's pricing policy. Good marketing possibilities seem to exist for flue-cured tobacco, groundnuts, cotton, sugar and beef. With the possible exception of sugar, various parts of the Northern Region offer favourable conditions for these crops and for beef cattle. The response of the farmers to the proposed programmes for the various cash crops will depend on the price paid to them. The marketing aspect of agriculture in Malawi is handled by Admarc. This organisation operates with obviously conflicting goals: it has to maximise and stabilise the incomes of the smallholders, while at the same time it is also assigned the task of accumulating development finance. This ambiguity has led to extraordinary high marketing margins for certain crops, tobacco and groundnuts in particular. The comparatively low price paid to the growers has in all probability discouraged the expansion of these crops.⁵⁾

. . .

Recently an I.B.R.D. mission to Malawi recommended the establishment of a National Rural Development Project (N.R.D.P.), involving the supply of packages of selected inputs to various rural areas in order to speed up agricultural development without placing too heavy a burden on the financial resources of the country.⁶⁾

The recommended strategy comprises the following elements:

- efforts to increase the sales of commodities with the best technical and marketing opportunities, including the enhancement of productivity in food crop cultivation;
- the supply of the necessary public services, including the demonstration of and instruction in new techniques, inputs, credit and marketing facilities. In later stages the services in the fields of home economics, education and health would have to be added;
- the planning of an infrastructure based on maps indicating land classification, cropping patterns, and erosion damage in order to identify road, market, water and soil conservation requirements.

It is expected that national coverage can be achieved for this type of programme within a period of 20 years, which would mean attracting 65,000 families per annum into the programme. Priority should be given to the high potential areas, although the ranking of areas might also be influenced by factors such as particularly depressed incomes and special needs. The I.B.R.D. obviously considers the rate of return the leading criterion by which to judge the implementation of individual projects in the context of the national rural development policy. This criterion will, however, often conflict with the other criteria: depressed incomes and special needs.

For the implementation of the first phase of the N.R.D.P., covering a period of 5 years from 1977 onwards, an estimated investment of K 17.0 million is required. This implies the selection, in the initial phase, of 2-3 new areas per year, each containing about 15,000 families, but the programme would have to be accelerated after some experience had been gained. The Northern Region in all probability has less high potential areas than the Central and Southern Regions but it has good grounds for claiming priorities in view of its depressed incomes position. However it is highly unlikely that more than 4 areas of 15,000 farm families can be involved in the initial implementation of the scheme in this region. This means that assistance may be given to 40,000-50,000 farmers by 1982. To this may be added some additional assistance given to existing programmes, especially the Karonga Rural Development Project. In all, a concentrated extension effort might be provided for 30 to 35% of all farm households in the region by 1982. The total number of households in the Northern Region is estimated at 152,000 in 1980 and 173,000 in 1985. This calculation reveals the impact of the N.R.D.P. for the commercialisation of agriculture in the Northern Region and consequent increases in monetary income.

The commercialisation of agriculture in Malawi, both in the pattern followed so far and the one recommended under the N.R.D.P., lays a strong emphasis on the cultivation of export crops. This increases the country's dependency on the world market and gives very little scope for a process of autonomous development. Development should, however, not be confused with an increase in the Gross Domestic Product or in average income per capita. Recently, there has been a growing awareness among economists that for a variety of reasons G.D.P. increases may indicate both development and absence of development. Seers, among others, advocates a new approach and defines development in terms of a decrease of poverty, an increase in employment opportunities and a decreasing income inequality.⁷⁾ Under the conditions operative in the Northern Region the first aim, i.e. a decrease in poverty, seems the most relevant. It implies the provision of sufficient food of good quality and variety, the fulfillment of the basic needs of clothing and footwear and the provision of improved housing conditions.

In the semi-autonomous projects the emphasis is put on export crops since only in this way can the foreign exchange required to repay the loans provided to establish these projects be earned. The crop targets in the Statement of Development Policies refer to the desired higher output of traditional food crops such as maize and groundnuts. An evaluation report of the Karonga Project, however, reveals that export crops are replacing food crops within the project area.⁸⁾ This is contrary to Malawi's agricultural policy and, moreover, may endanger the food situation in the area unless measures are taken to grow the food in adjacent parts of the region. In the forthcoming National Rural Development Programme, as outlined in the I.B.R.D. report, a similar bias to the cultivation of export crops is noticeable. Only incidental attention is being paid to the cultivation of food crops. Moreover, both in the Statement of Development Policies and in the I.B.R.D. report there is very little attention to improving the variety of the diet.

To enable the inhabitants of the Northern Region to purchase adequate clothing and footwear a rise in monetary income is a

necessary pre-condition, but of equal importance is the supply of cheap, locally made textiles and shoes. There is ample scope for the improvement of housing conditions without high capital costs. What it primarily requires is a detailed plan, an optimal use of local construction material, credit facilities to purchase building materials not available locally, and the training of artisans for construction activities. Finally, rural water supply is an essential element of improved living conditions in the rural areas. Successful measures in these fields will hardly be reflected in the region's G.D.P. but they will mean a fundamental improvement in living conditions.

- To sum up, the development effort for the Northern Region requires
- a detailed data collection research programme, with emphasis on the region's agricultural potential and the present farming systems in order to identify the constraints in smallholder agriculture in the various parts of the region;
 - agricultural research of two types: basic research at research stations under optimal conditions with emphasis on technical aspects; and adaptive research to modify and fit the results of the basic innovations research to the farm conditions of a specific area, particularly the economic circumstances under which the farmer operates.
 - the formulation of a development strategy for the region directed to an improvement in the standard of living of the entire population in terms of a reduction of poverty, increasing employment, and greater income equality.
 - the formulation of an integrated development plan, with a careful co-ordination of the various sectors of the economy, and an awareness of the need for subregionalisation if the general strategy is to be adaptable to the specific circumstances in the various parts of the region. Such a plan will have to take account, among other things, of the integration of agriculture and livestock activities in certain areas; the adjustment of the transportation network
 - notably the crop extraction roads - to the spatial distribution of production activities; and the concentration of services according to the four level hierarchy of service centres. In view of the shortage of capital considerable emphasis should be placed on the use of local labour to create capital by means of the execution of self-help projects.

In connection with the N.R.D.P. the Ministry of Agriculture has devised a pre-investment programme which covers various requirements mentioned above. Three types of studies will be initiated: land resources and population surveys, agro-economic surveys and crop trials. The land resources surveys will be undertaken by the Land Husbandry branch and will cover both the infrastructural planning and the detailed farm planning. Furthermore, the Agro-Economic Survey programme is to be expanded. And finally, crop research of an adaptive type is planned. In the Northern Region cotton and groundnut trials will be carried out; the areas tentatively selected for cotton are the Rumphu area, the Songwe valley and the area of the Karonga Rural Development Project.

Moreover, the ministry has made a tentative selection of priority areas. For the Northern Region the selected areas have as yet been only roughly indicated:

- Karonga - K.R.D.P. : Karonga and Chitipa district
- Mzuzu - R.A.O. (N) Rumphu, Henga Valley and Nkata Bay Lakeshore
- Mzimba - R.A.O. (N) Mzimba district and Mpherembe.

Among these the Chitipa district will receive immediate priority apparently on account of the low income position of its population. Because of the objectives of the N.R.D.P. and the necessity to devise packages of inputs tailored to the potential of an area and the needs of its population, it seems appropriate to draw up a functional sub-regionalisation of the Northern Region.

CHAPTER 4.2.

A SUB-DIVISION OF THE NORTHERN REGION INTO PLANNING AREAS.

The Northern Region as an administrative unit is not automatically the most suitable entity for planning purposes. The region is neither homogeneous in physiographic, social and economic respects, nor does it form one functional hinterland to a regional centre. However, one can arrive at functional and homogeneous areas by sub-dividing the Northern Region into planning areas and planning regions.

Planning areas form a basic spatial framework for the planning of production activities and social services, roads and transportation. The development of production activities in the fields of agriculture, livestock and forestry, and the planning of these activities require the delimitation of planning areas which are more or less uniform in terms of - potential - land use and farming system. A farming system comprises elements of farm size, cropping patterns and conditions of tenure. This tenure aspect can be regarded as more or less uniform for the whole region. Beside these agricultural production criteria for the delimitation of planning areas, additional criteria have to be taken into account such as population distribution and density, roads and transportation facilities, and service centres to group planning areas into planning regions.

The two sub-divisions of the Northern Region which are currently used in Malawi are the Natural Regions and Areas ⁹⁾ and the Ecological Planning Areas (EPA). A Natural Region is defined as a part of the earth's surface within which the characteristics of the physical environment are relatively uniform. A Natural Area constitutes a sub-division of a Natural Region. In the delimitation of Natural Regions and Areas the following aspects are taken into account: altitude, mean annual temperature, mean annual rainfall, soil parent materials, landforms, vegetation and soils. At least three of these aspects are relatively uniform for each Natural Region, together with other aspects which are uniform for all except one or two Natural Areas. The sub-division into Ecological Planning Areas (EPA) is used in the Ministry of Agriculture. An EPA sometimes comprises one or more Natural Regions, but in other cases also parts of Natural Regions are grouped into an EPA. In the activities of the Agricultural Extension Branch, EPA's are again grouped together and labelled Supervisor Area, which are administered by an Area Supervisor who co-ordinates the extension activities in this area.

For several reasons both the Natural Regions and the EPA's are not very suitable entities for planning purposes. The uniformity of a Natural Region is determined by at least three criteria out of seven. These three criteria, however, may differ from one Natural Region to the other. The EPA's, as an aggregate of several Natural Areas, offer the same problems as Natural Regions: land use varies widely within one EPA. Moreover, the criteria applied in delimiting EPA's are not known. The sub-division of Natural Regions into smaller Natural Areas results in a higher degree of homogeneity, and although even here one is confronted with the problem of criteria which vary from one area to another, they may form a basis for agricultural production planning activities, if data on the existing agricultural system are added. The sub-division of the Northern Region into agricultural production planning areas (APPA) in this report has been based on agricultural potential and the existing farming system.

A broad insight into the potential agricultural use of land in the Northern Region was obtained from the Agricultural Potential map. This map shows the suitability of land for the intensive/extensive cultivation of various crops, for cattle rearing and for forestry activities. The boundaries of the areas on this map coincide with those of the Natural Areas.

Unfortunately very little information is at present available about farming systems in the Northern Region. The need for detailed data in this field is obvious. Only in a few areas have agro-economic surveys (A.E.S.) been carried out. For Mbawa, Karonga-North and the Hara Irrigation Scheme the results of these surveys have been published; for the Mpompha coffee area and the Chisasa tobacco area surveys have been completed but results are not yet available; while new surveys are currently being undertaken in the Henga valley and the Bulambya Plain. Data on cropping patterns and farm sizes have therefore chiefly been derived from the NSSA '68/'69 and interviews with Area Supervisors of the Ministry of Agriculture in the Northern Region, and A.E.S.-figures have only been used as a check on these data.

The limitations of the available information make clear that a sub-division of the region into Agricultural Production Planning Areas has necessarily a provisional character. Table 19 and map 15 show some particulars, the location and boundaries of the 23 APPA's distinguished in the Northern Region. A more detailed description of each APPA including data on agricultural potential, population size and density, aspects of the farming system, migration, transport, and service centres is given in Appendix I. The boundaries of the APPA's generally follow the boundaries of agricultural potential areas (see map 1). For the sake of contiguity we sometimes made an exception to this rule; see for example the boundaries between APPA's 9, 10, 11, 12, 19 and 20. In some other cases the areas hardly deserve the name APPA because of their highly limited agricultural potential and very sparse population. This applies to area 4, 7 and 18.

The Agricultural Production Planning Areas can be grouped into several Planning Regions. This higher level of delimitation is introduced because not all planning in the region is concerned with agricultural production only. The planning of health facilities, educational facilities, bus routes, etcetera, may involve a number of APPA's. In addition, the range of a larger service centre, viz. the urban centre, usually exceeds that of the APPA in which it is located. Accessibility, in terms of distance, landforms and access by road is therefore the determining criterion in the formation of Planning Regions. Three Planning Regions have been distinguished, viz. (A) Karonga-Chitipa, (B) Mzimba-Rumphi, and (C) Nkhata Bay. The APPA's are grouped as follows over the Planning Regions:

Karonga-Chitipa	: 1-8
Mzimba-Rumphi	: 9-18
Nkhata Bay	: 19-23

Admittedly, it is important to avoid crossing administrative boundaries unnecessarily in the delimitation of the APPA's and the Planning Regions, since this would complicate the government's activities in the field of planning and implementation. In a few cases, however, there were such marked differences between the criteria applied and the administrative sub-division that administrative boundaries had to be crossed.

Map 15

Agricultural production planning areas and planning regions

- Planning Region
 ---- APPA

Planning Region A Karonga - Chitipa

- 1 North-Karonga
- 2 Central-Karonga
- 3 South-Karonga
- 4 Karonga Scarp Zones
- 5 Misuku Hills
- 6 Bulambya and Songwe
- 7 North-West Chitipa
- 8 Nthalire

Planning Region B Mzimba - Rumphi

- 9 Nyika
- 10 Central Rumphi
- 11 Phoka
- 12 Vipya North
- 13 Vwaza
- 14 North-West Mzimba
- 15 Mzuzu-Mombera
- 16 Central and South-West Mzimba
- 17 West Mabulabo
- 18 East Mabulabo

Planning Region C Nkhata Bay

- 19 Central Lakeshore Area
- 20 North Nkhata Bay
- 21 Nkhata Bay Lowlands
- 22 Vipya
- 23 Likoma/Chisumulu

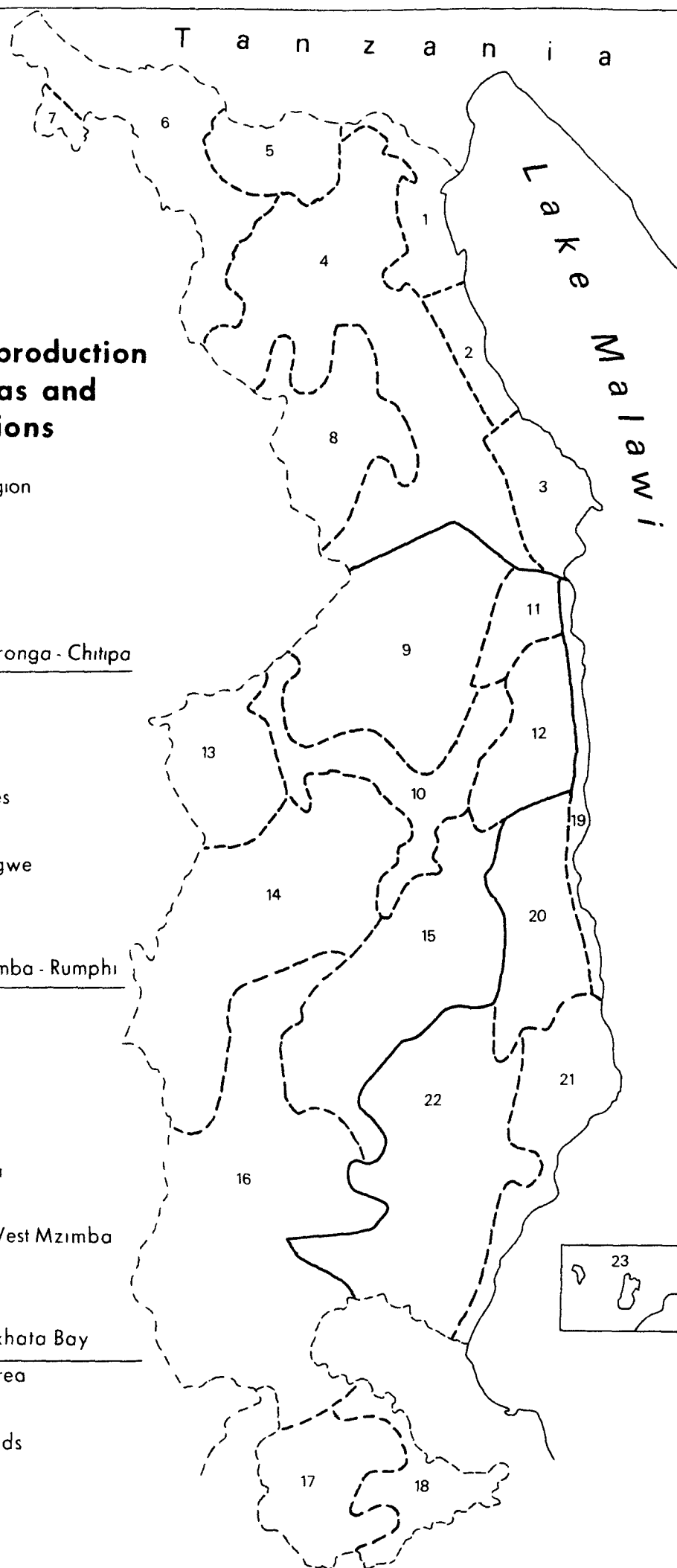


Table 19

Agricultural Production Planning Areas in the Northern Region

code	name	district	agricultural potential(1)	principal food crops(2)	principal cash crops(2)	average farm-size (acre)
1	North-Karonga	Karonga	Aii (Aiii,G,D)	R,Ca (Ba)	R	3
2	Central-Karonga	Karonga	Aii,D (G)	M (R)	C,G	4-5
3	South-Karonga	Karonga	Aii (B,D,Aiii)	Ca	R,G	4-5
4	Karonga Scarp Zones	Karonga-Chitipa	-- (D)	--	--	--
5	Misuku Hills	Chitipa	Ci (E)	Ba,P,Po (M,Ca)	Co	2 Co
6	Bulambya & Songwe	Chitipa	B (D,Ai,G,E)	M,G,P	--	4
7	North-West Chitipa	Chitipa	--	--	--	--
8	Nthalire	Chitipa	B,D	M,G,P	--	4
9	Nyika	Rumphi	National Park and Forest Reserves			
10	Central-Rumphi	Rumphi-Mzimba	Ai,Aiii (D,B)	M,G,P	C T	4
11	Phoka	Rumphi	Ci	M,P (Ba,S)	Co	2-3
12	Vipya-North	Rumphi	Ci (E)	M,P (Ca,Po)	Co	3-4
13	Vwaza	Rumphi	Game Reserve			
14	North-West Mzimba	Rumphi-Mzimba	B (G,D)	M,G (Po,Ca)	T	5-6
15	Mzuzu-Mombera	Mzimba	Ai,B (D,G)	M,G,P	--	5
16	Central and South-West Mzimba	Mzimba	Ai,D	M,G,P	T	6-8
17	West-Mabulabo	Mzimba	Ai,B	M,G,P	T	5
18	East-Mabulabo	Mzimba	--	--	--	--
19	Central Lake-shore area	Rumphi-Nkhata Bay	-- (Aiii,D)	Ca	--	1-2
20	North-Nkhata Bay	Nkhata Bay	Ci (D)	Ca (Ba,M)	Co	3-4
21	Nkhata Bay Low-lands	Nkhata Bay	Cii,G (Aiii)	Ca (R)	R (Te)	1-2
22	Vipya	Nkhata Bay Mzimba	Vipya Pulpwood Project			
23	Likoma-Chisumulu	Nkhata Bay	--	Ca	--	--

Table 19 continued

Source: (1) Young A. and Brown, P, The Physical Environment of Northern Nyasaland, Zomba 1962.

(2) personal communication.

N.B. (1)	Ai	Intensive farming: maize, groundnuts, tobacco
	Aii	Intensive farming: maize, cotton, rice
	Aiii	Intensive farming: food crops
	B	Extensive farming: maize, groundnuts, tobacco
	Ci	Perennial crops: coffee, tung
	Cii	Perennial crops: tea, rubber, cacao
	D	Livestock ranching
	E	Afforestation
	F	Game reserve
	G	Marsh
	H	Natural forest

(2)	Ba	bananas	P	pulses
	C	cotton	Po	potatoes
	Ca	cassava	R	rice
	Co	coffee	S	sugar
	G	groundnuts	T	tobacco
	M	maize	Te	tea

CHAPTER 4.3.

PRIORITIES BETWEEN AREAS IN THE NORTHERN REGION.

In view of the limitations on available manpower and a shortage of other investment resources, in any planning exercise, priorities for development activities have to be established. This applies to priorities between various types of activities and projects on the one hand and priorities between areas on the other.

The crucial question is: on the basis of which criteria do priorities have to be determined? These criteria are, of course, highly dependent upon the development strategy adopted. As regards the various types of activities, some remarks have been made in the preceding paragraphs, in which emphasis was put on (1) the interpretation of the development concept in terms of the improvement on criteria indicative of the living conditions of the population instead of on increases in GDP and average monetary income per capita; and (2) as a consequence, stimulating autonomous development instead of expansion of the export crops only. Moreover, it should be stressed that activities in various sectors influence each other and are mutually interdependent. The implementation of measures in the field of agricultural production asks for carefully adjusted development of socio-economic services and infrastructural facilities. In other words, the establishment of integrated development programmes per APPA and Planning Region are needed.

The I.B.R.D. report in which the establishment of a National Rural Development Programme was recommended also states criteria for determining priorities between areas in Malawi. First priority should go to areas with high potential, "in order to maximize the benefits derived from the available investment resources". However, other areas may claim priority on the basis of particularly depressed incomes or identified special needs. For all areas it would apply that high-yielding and well-tested innovations must be available. Some remarks should be made about these criteria and their applicability to the situation in the Northern Region.

First, a distinction should be made between areas with high potential on the one hand, and those with particularly depressed incomes and special needs on the other. Priority for the first type will undoubtedly increase income disparities since the high potential areas are usually the more developed ones, although the strategy of the National Rural Development Programme is presented as one which offers possibilities to avoid widening income disparities between regions. In addition, high-yielding and well-tested innovations will chiefly be available for high potential areas. Depressed income areas and special need areas will usually be characterised by a lower agricultural potential or by physiographic conditions less conducive to the application of innovations. Without denying the relevance of a fast improvement of high potential areas under conditions of limited resources, a rigid application of the growth criterion may seriously restrict the chances for development of certain depressed income areas and special need areas.

Secondly, the special needs are not defined in the I.B.R.D. report. They may comprise a variety of socio-economic constraints which are usually only identifiable at the grass-root level and consequently require detailed investigation in each APPA. On the basis of the

data collected in the context of this survey attention can only be paid to shortages of land, lack of water, food shortages and poor accessibility.

Thirdly, there is a woeful dearth of information about the potential for agricultural production and, particularly, about the income conditions in the Northern Region. The identification of areas with particularly depressed incomes therefore offers considerable problems. The estimated cash incomes on the basis of marketed agricultural production per capita (see table 20) cover only a fraction of total income. First, these cash incomes do not take into consideration any differences in subsistence production between areas. In addition, the figures only cover that part of marketed agricultural production collected by Admarc and do not comprise sales in local markets and those to neighbouring farm households. Moreover, no data are available about income from non-agricultural activities in the area and, considerably more important, the remittances to relatives by migrants working in other parts of the country or abroad. If one takes account of the generally low employment opportunities outside smallholder agriculture, almost the whole Northern Region can be regarded as a depressed income area. The remittance of migrants form a necessary supplement to the low incomes in the region and migration may to some extent be used as an indicator of depressed incomes. Again, data on migration are hardly available. The 1966 population census is out of date and, moreover, of insufficient reliability to allow of the calculation of sex ratios per age category for areas within the regions as a yardstick for the differences in the rate of migration.

Fourthly, the criterion of high-yielding and well-tested innovations is insufficiently specified. The report does not state whether "high-yielding" should be interpreted in terms of physical quantities per acreage or in monetary terms per unit of labour input. Adoption by the farmer will particularly depend on the latter.¹⁰ We lack the data of research stations for a proper application of this criterion to the conditions in the Northern Region. The use of it may, however, create a bias in favour of the cultivation of export crops since, in general, agricultural research has been strongly geared to these export crops.

In view of these remarks a classification of the various APPA's in the Northern Region in the light of the criteria recommended by the I.B.R.D. report is an extremely hazardous exercise, and the resulting classification can be no more than tentative.

High potential areas

According to table 19 the following APPA's are characterised by a relatively good agricultural potential:

APPA 1,2 and 3	Karonga Lakeshore
APPA 10	Central Rumphu
APPA 16	Central and South West Mzimba
APPA 17	West Mabulabo

Depressed income areas

In spite of the lack of information in this field some APPA's are known for their particularly weak position. These are APPA 6 (Bulambya and Songwe) and 20 (North Nkhata Bay), with populations of respectively 33,710 and 50,950. As the employment situation (outside smallholder

agriculture) in Chitipa district is extremely weak, additional incomes from non-agricultural activities in APPA 6 are almost non-existent. The sex ratio of 91-100 indicates an outmigration of males. The income position of APPA 20 seems to be slightly better in view of the employment opportunities in Nkhata Bay district and Mzuzu. Still, the sex ratio in North Nkhata Bay varies between 71-100, indicating a sizeable out-migration of males.

Special need areas

Shortages of land cannot be regarded as an overall problem in any APPA. Land shortages only occur locally, mostly connected with a shortage of (drinking) water, and sometimes with a shortage of irrigation water. The smallholders tend to settle near streams and boreholes. These concentrations lead in some cases to pressure on the land, for example near Mpherembe (APPA 14) and Chilumba (APPA 3). These land shortages can be relatively easily overcome by hydro-technical improvements. In some APPA's, however, land shortages occur in connection with permanent food shortages. Examples of these are APPA's 18, 19 and 23. In APPA 18 (East-Mabulabo), the upland coffee growers lack sufficient acreages for food crops. For years now food has had to be imported. Any improvement in this situation may involve far-reaching changes in the farming systems of the area. APPA's 19 (Central Lakeshore area) and 23 (Likoma/Chisumulu) are completely oriented on fishery activities. The physiographic conditions and the concentrations of population in both areas leave little land for food crop gardens. In other areas of the Northern Region (APPA's 2, 6 and 8) foodshortages sometimes occur. In these cases it is not land shortages that form the main problem but the general low level of agricultural productivity.

A serious lack of accessibility can be mentioned for most mountainous areas in the Northern Region. In this respect reference could be made to APPA's 4 (Karonga Scarp Zones), 5 (Misuku-Hills), 11 (Phoka), 12 (Vipya North), 18 (East-Mabulabo) and 20 (North Nkhata Bay). An extreme example of isolation is provided by APPA 19 (Central Lakeshore area). This area can only be reached by boat; within the APPA there are no roads at all. APPA 8, too, is confronted with a peripheral location and a relatively high degree of isolation.

. . .

In the context of the Northern Region, the criteria of depressed incomes and special needs conflict with the criterion of high potential. If the criterion of high potential is used for choosing priority areas, only a few APPA's will benefit. Furthermore, these areas already have a relatively favourable position within the Northern Region. If priority areas are chosen on the basis of the other two criteria, development programmes are urgently needed in almost all APPA's. This situation stresses the need for the formulation of a development strategy for the Northern Region, one which includes objectives and priorities for development.

Table 20

Total value of the marketed agricultural production (K) in 1971/72, the estimated population (1971) and the value per capita (K) (1971/72) for all APPA's

Name of APPA	total value of marketed agr.production,K 71/72	estimated population,'71	value per capita,(K) 71
1. North-Karonga	247,671	50,600	4.80
2. Central-Karonga	22,697	11,540	1.90
3. South-Karonga	125,681	16,990	7.40
4. Karonga Scarp Zones	n.a. ¹⁾	n.a.	n.a.
5. Misuku Hills	15,931	17,900	0.90
6. Bulambya and Songwe	4,410	33,710	0.13
7. North-West Chitipa	n.a.	n.a.	n.a.
8. Nthalire	7,290	10,720	0.70
9. Nyika	n.a.	n.a.	n.a.
10. Central Rumphu	77,222	31,550	2.40
11. Phoka	6,833	10,050	0.70
12. Vipya North	15,050	9,180	1.60
13. Vwaza	n.a.	n.a.	n.a.
14. North-West Mzimba	67,497	63,200	1.10
15. Mzuzu-Mombera	n.a.	n.a.	n.a.
16. Central and South-West Mzimba	146,522	125,050	1.20
17. West-Mabulabo	26,269	21,250	1.20
18. East-Mabulabo	2,289	7,080	0.30
19. Central Lakeshore area	n.a.	n.a.	n.a.
20. North Nkhata Bay	6,255	29,790	0.20
21. Nkhata Bay Lowlands	126,664	50,950	2.40
22. Vipya	n.a.	n.a.	n.a.
23. Likoma/Chisumulu	n.a.	n.a.	n.a.

1) n.a. : not applicable

Source: Ministry of Agriculture, SCA, STA.
Malawi Population Census 1966.

CHAPTER 4.3.

PLANNING OF SERVICES AND SERVICE CENTRES.

The absence of a clear strategy and programmes for the improvement of production activities in the region as a whole, and at the planning area level, hampers planning in the field of services. In spite of this we have made projections for education and health services for the region, taking into account government criteria for these services according to population size and distribution, and assuming a 2.5% increase per annum in the region's population. In addition, suggestions are made for the future pattern of service centres. (Details for the various APPA's are given in Appendix II). Finally, a plea is made for the establishment of a regional planning machinery.

Education

Table 21 shows the estimated population in the age-class 6-13, from which the potential number of pupils in primary education in 1975, 1980 and 1985 be derived.

Table 21
Education services, 1971-1985

Year	estimated total population	estimated population 6-13 yrs.	expected number of pupils ⁺	number of classes needed ⁺⁺	number of schools needed ⁺⁺⁺
1971	563,000	121,000	-	-	-
1975	621,000	133,000	103,000	2575	322
1980	703,000	150,000	117,000	2925	366
1985	795,000	171,000	133,000	3325	416

+ at stable enrolment ratio of 77.7%

++ optimal enrolment ratio per class of 40.0

+++ single stream full primary schools.

In 1971, there were 431 primary schools in the Northern Region. The enrolment ratio in 1971, 77.7% considerably exceeds the national objective (50.0%). Therefore it is not realistic to aim at a large increase of primary schools in the Northern Region in the near future. The table shows that the existing capacity will be sufficient until about 1987. The estimates assume, however, that the existing capacity is equally distributed over the Northern Region. This is not correct, which means that in certain areas the actual capacity of schools remains below the favourable regional average.

It would therefore seem justifiable to locate new primary schools in a few unserved areas (see map 9). Outside these areas no expansion of primary schools is required in the near future.

Medical services:

If we assume that the average number of people per dispensary and per hospital bed remains constant, the following table shows the required number of dispensaries and hospital beds in the Northern Region for 1975 and 1980.

Table 22
Health facilities, 1972-1980

year	estimated total population	number of dispensaries needed +)	number of hospital beds needed
1972	577,658	65++)	1196
1975	621,000	70	1286
1980	703,000	80	1455

+) including dispensary facilities at the hospitals

++) actual number

In order to meet the national objective that everyone should live within 8 miles of a dispensary, 15 new dispensaries are required for the Northern Region. It is proposed that the construction of these dispensaries is phased over the period 1972-1980, taking into account a more or less constant population-dispensary ratio. If the government wants to maintain the population-dispensary ratio after 1980, new dispensaries would have to be constructed, although it might also be considered to increase the staff of the existing dispensaries. In the latter approach priority should be given to the most populated areas: Karonga Lakeshore, Nkhata Bay Lakeshore, SW Mzimba and the Henga Valley. In a similar way the required number of hospital beds in 1975 and 1980 has been estimated, assuming that the region's favourable bed ratio (2.07 beds per 1000 inhabitants) if compared with the national objective (2.00) would not rise.

In 1972 hospital facilities were not optimally distributed, and any extension of the number of beds in the Northern region should therefore be carefully located.

Map 10 shows that the capacities of the hospitals at Karonga, Kaporo, Chilumba, Chitipa, Katumbi, Embangweni, Mzimba and Rumphu should be increased. New hospitals are required at Ntalire and Usisya. In addition the capacity and the quality of staff of Chintechu hospital will have to be expanded to cope with the increased population engaged in forestry and related industrial activities.

Service centres

If development efforts in the Northern Region are to function efficiently, an optimal structure of service centres is required. As shown in part 3 the present pattern of services is still insufficient. Therefore in the areas not served at present by service centres the establishment of new service centres is recommended. (Map 14). If, as part of the development efforts in the Northern Region, new services are required, these ought to be concentrated, as far as

possible, in the existing and newly recommended service centres. Thus this proposed new hierarchical structure of service centres should be regarded as a structure to be implemented gradually along with the development in the Northern Region. The location of new centres has been chosen in such a way that a minimum of overlapping of service areas will occur, while at the same time a maximum number of people is served. In assigning new local centres to unserved areas, priority has been given to small clusters of services especially those providing 3 or 4 key facilities. If no clusters of this size come into consideration, smaller clusters have to be taken, again with priority to those providing 3 or 4 key facilities. To complete the pattern of rural market centres, some local centres have been proposed which may grow into rural market centres in the future if medium level services are located in these centres. Finally, some unserved areas were considered to be too small in size or too sparsely populated to justify the location of a local centre in the future. Therefore, so called "additional centres" have been recommended for these sparsely populated areas, in which the most elementary services can be located. For the pattern of service centres to function efficiently, these centres need to be connected by a hierarchical system of roads. Consequently all additional and local centres should be served by a dry weather road, rural market centres at least by all season roads and urban centres by all weather roads.

Planning activities and the implementation of programmes have to be undertaken by the administrative machinery. At present, there is no special government organisation in Malawi dealing with regional planning. Moreover, no planning units have been established in the regions as yet. There is, however, an obvious need for both. The programmes and plans of various government departments have to be co-ordinated and integrated at the national level and to be specified as regional plans. In addition, the implementation of regional plans should preferably be channelled through a regional planning committee which also functions as a clearing house between the national government and the local population. Moreover, in order to achieve a successful implementation of the various development efforts in the planning areas and the planning regions a close co-operation of all departments involved and of the local population is required. The co-ordination of the activities of the various government departments and the assistance of the local population could be achieved by the establishment of planning units at the level of both planning areas and planning regions, to which representatives of the local population and officers of key government departments are admitted. A final remark has to be made about the co-ordination of development activities by government departments and various agencies. The location of new services in the region provided by any government or private organisation should be authorised by the planning committee at the regional level. In addition, in the field of health services the present activities of the central government, the district councils and the voluntary organisations should be co-ordinated.

- 1) Statement of Development Policies 1971-1980, Office of the President and Cabinet, Economic Planning Division, Zomba, December 1971, p. 34.
- 2) R. Chambers, Settlement Schemes in Tropical Africa, A Study of Organizations and Development, London, 1969, and A.O. Ellman, Tanzania's attempts at introducing agricultural improvements through co-operative farming, E.A. Jl. of Rural Development, 1970, Vol. 2.
- 3) Statement of Development Policies, *ibid*, p.34.
- 4) A.T. Mosher, Getting Agriculture Moving, New York, 1966.
- 5) K. Quinten and J. Sterkenburg, Marketing of Smallholder Produce in Malawi, 2 Vols. (AES report, 1975) for an analysis of the marketing margins of the various crops collected by Admarc. There is very little information about the way Admarc uses these funds to finance development.
- 6) Document of International Bank of Reconstruction and Development, International Development Association, Agricultural Sector Review, Malawi, East Africa Regional Office, December 28, 1973.
- 7) Dudley Seers, What are we trying to measure?, in Nancy Baster (ed.). Measuring Development, The Role and Adequacy of Development Indicators, London, 1972.
- 8) Document of IBRD/IFC/IDA, Appraisal of the Karonga Rural Development Project, Phase I.
- 9) A.Young and P. Brown, The Physical Environment of Northern Nyasaland, Zomba, 1962.
- 10) For a detailed discussion on the various aspects of the introduction of improved maize varieties in Malawi, we refer to Quinten and Sterkenburg, *ibid*, Vol.II the paragraph entitled "Changes in the yields per acre as a result of improved crop husbandry".
- 11) D.B.W.M. van Dusseldorp, Planning of service centres in rural areas of developing countries, Wageningen, 1971.

APPENDICES

APPENDIX I SOME BASIC DATA ABOUT THE APPA'S IN THE
NORTHERN REGION

APPENDIX II RECOMMENDATIONS FOR PLANNING REGIONS

APPENDIX I

SOME BASIC DATA ABOUT THE APPA'S IN THE NORTHERN REGION

For each APPA some basic data is provided and a few particular problems are briefly discussed. Attention is paid to (1) general aspects and agricultural potential, (2) population density, land pressure and migration (3) farming systems, commercialisation and non-agricultural activities, (4) food shortages and lack of water, (5) roads and transportation and (6) coverage of the area by service centres.

Planning Region A: Karonga-Chitipa

This Planning Region covers the Karonga and Chitipa districts and comprises APPA 1-8. In Planning Region A, the Karonga Rural Development Project (KRDP) started in 1972. At present the KRDP especially directs its activities to APPA 1, 2 and 3. Livestock improvement programmes are carried out in APPA 6 and 8.

1. North-Karonga.

- (1) This Northern part of the Karonga Lakeshore plain has potential for the intensive cultivation of maize, cotton and rice.
- (2) The population density is generally high (> 150 p.p.s.m.). A large part of the area is under cultivation; without intensification of agriculture, partly by the construction of irrigation works, land shortages may occur in the future. The sex-ratio is 91-100 (males per 100 females) but at present there is no frequent out-migration; some immigration occurs from Tanzania and Chitipa district.
- (3) Average farm size is 3 acres. Rice and cassava are the main food crops; rice is also cultivated as a cash crop. The value of marketed agricultural production (K) in 1971/72 per capita is about K 4.80. There are 2 rice settlement schemes in the area; new ones are currently established. Almost all farmers have cattle; there is some fishing activity along the lake-shore.
- (4) Food does not have to be imported; lack of water occurs at Mpata.
- (5) The area is largely opened-up by the Karonga-Kaporo all-weather road and is connected to other APPA by the bituminised lake-shore road. Feeder roads are present in the APPA, except in the north-eastern part. Bus facilities are available throughout the year; access to Lake transport facilities via a jetty at Kambwe.
- (6) Karonga is an urban centre; the northern and the central parts of the APPA lack service centres at the level required.

2. Central-Karonga.

- (1) This section of the Karonga Lakeshore plain has in some parts potential for the intensive cultivation of maize, cotton and

and rice and in others for livestock.

- (2) Population density is high (>150 p.p.s.m.). There is no shortage of land. The sex-ratio of 91-100 indicates an out-migration of males; no accurate data about migration is, however, available.
- (3) The average farm size in this APPA is 4-5 acres. Maize and ground-nuts are the main food crops; cotton and groundnuts are cash crops. In recent years groundnut cultivation decreased because of a reduction in the price paid to farmers. Marketed agricultural income per capita amounts to K 1.90 ('71/72). Most smallholders have cattle; fishing results in additional income along the Lakeshore.
- (4) Food shortages sometimes occur in the Lupembe-Mlale area; this area also suffers from a lack of water.
- (5) Central-Karonga is well opened up by roads: the bituminised Karonga-Chitimba road crosses the area. An all-season bus route is maintained on this road.
- (6) The area is poorly served by service centres.

3. South-Karonga.

- (1) This APPA covers the southern part of the Karonga Lakeshore plain, an area with potential for the intensive cultivation of maize, cotton and rice.
- (2) Population density is high (>150 p.p.s.m.). A large part of the area is under cultivation. In some parts, particularly near Chilumba, land shortages occur. The sex-ratio is 91-100; details about migration are not known.
- (3) The average farm size is 4-5 acres. Cassava is the main food crop; rice and groundnuts are cultivated as a cash crop. Most of the marketed rice originates from the 2 rice settlement schemes in the APPA. Average income per capita from marketed agricultural produce amounts to K 7.40 per annum. Many farmers have cattle; fishing forms an additional source of income along the Lakeshore.
- (4) There are no food shortages. In the inland areas, water is scarce.
- (5) South-Karonga is well opened-up by roads: The Karonga-Chitimba road crosses the area. The connection with the Henga valley provides a problem, as at present the Livingstonia Escarpment can only be crossed by small vehicles. Public transport is available; a jetty has been constructed at Chilumba.
- (6) Chilumba is a rural-market centre, which serves large parts of the APPA. The pattern of service centres is reasonably well developed; the southern and western parts of the APPA lack local centres.

4. Karonga Scarp Zones.

- (1) This mountainous, inaccessible area covers parts of both Karonga and Chitipa districts. The APPA has no agricultural potential, except in some small isolated areas with potential for livestock.
- (2) The Karonga Scarp Zones are almost uninhabited.
- (3) Not applicable.
- (4) Not applicable.
- (5) The all-season Karonga-Chitipa road is crossing the northern part of this APPA; in the west, a section of the dry-weather Chisenga-Mwenwenya road crosses the area.
- (6) Not applicable.

5. Misuku Hills.

- (1) This mountainous area in the north of Chitipa district has potential for the cultivation of perennial crops.
- (2) The Misuku Hills are rather densely populated (100-150 p.p.s.m.). There seems to be enough land suitable for coffee cultivation, but only small areas suitable for food crops. An estimated 25% of the male population lives outside the APPA (either elsewhere in Malawi or outside the country), according to personal communications. Yet, the 1966 census gives a sex-ratio of 91-100.
- (3) Data on farm sizes in this APPA are not known. Coffee is cultivated as a cash crop; the main food crops are bananas, pulses and potatoes. The value of marketed agricultural produce amounts to K 0.90 per capita ('71/72). Many farmers have cattle.
- (4) In recent years, sometimes food shortages were reported.
- (5) One dry-weather road crosses the Misuku Hills and forms a connection with the adjoining APPA 6. Feeder roads are absent. Lack of roads hampers coffee transport from the coffee pulperies in the area. There is a dry-season bus route to Misuku.
- (6) Only a local centre is serving the APPA.

6. Bulambya and Songwe.

- (1) This part of the dry western plains has potential for the extensive cultivation of maize, groundnuts and tobacco.
- (2) The population density does not exceed 100 p.p.s.m.; no land shortages occur and only a small part of the area is under cultivation. Reportedly, there is a rather strong out-migration of males, but details on numbers and destination are not known. Yet, the sex-ratio is between 91 and 100 (census 1966).
- (3) The average farm size is 4 acres. The main food crops are maize, groundnuts and pulses; there is no special cash crop. Surpluses are marketed; the value of marketed produce amounts to only K 0.13 per capita ('71/72). About half of the smallholders have cattle.
- (4) Food shortages occurred in recent years. Water is scarce in the Chitipa-Chendo-Kapopka area.
- (5) The APPA is connected with Rumphi by an all-weather road (via Zambia), while an all-season road provides a connection with the Karonga Lakeshore plain. The road network within the APPA is fairly well developed. Dry-season bus facilities serve only a small part of the APPA.
- (6) The urban centre Chitipa serves the central part as a rural market centre; the northern and eastern parts of the APPA lack local centres.

7. North-West Chitipa.

- (1) A small APPA with hardly any agricultural potential.
- (2) The population is sparse.
- (3) Not applicable.
- (4) Not applicable.
- (5) An all-weather road crosses the APPA and connects North-West Chitipa to APPA 6.

- (6) There are no service centres.

8. Nthalire.

- (1) This APPA has in some parts potential for extensive cultivation of maize, groundnuts and tobacco and in other for livestock.
- (2) The population density is low, except in the central part where the density varies from 50 to 100 p.p.s.m. There is no shortage of land. Exact data on out-migration are not available, but the sex-ratio is 91-100.
- (3) The average farm size is 4 acres. The main foodcrops are maize, groundnuts and pulses; there is no distinct cash crop. The value of marketed agricultural produce amounts to K 0.70 per capita ('71/72). Many farmers have cattle.
- (4) Food shortages were reported in some recent years; scarcity of water is a problem throughout the APPA.
- (5) Nthalire is relatively isolated. The area is only opened up by a dry-weather road, which also forms the connection with APPA 6 and 9. Large areas are at present not accessible. No bus route crosses the APPA.
- (6) There is only a local centre in the area.

Planning Region B: Mzimba-Rumphi.

Planning Region B covers the largest part of the Mzimba and Rumphi districts. The Lakeshore area of Rumphi district is not included in the Planning Region, but added to Planning Region C (APPA 19). Also small parts of APPA 22, which are located in Mzimba district belong the Planning Region C.

Planning Region B comprises APPA 9-18.

9. Nyika.

- (1) An area of high plateaus and mountains, separated by deep valleys with steep slopes. There is good potential for forestry and livestock.
- (2) The Nyika is uninhabited, except for Chelinda-camp.
- (3) There are no agricultural activities. A large part of the APPA is National Park. Furthermore, the APPA includes some forest reserves.
- (4) Not applicable.
- (5) The National Park is connected with APPA 8 and 10 by a dry-weather road. An airfield has been established at Chelinda. There is no bus route through the area.
- (6) No service centres; Chelinda-camp serves the Park.

10. Central Rumphi.

- (1) This long narrow area has potential for the intensive cultivation of maize, groundnuts and tobacco.
- (2) The APPA is rather densely populated (100-150 p.p.s.m.); in the Henga valley the density exceeds 150 p.p.s.m. There are no land shortages. Exact data on out-migration are not available, but the sex-ratio is in general 91-100 and in the north-eastern part of

the Henga valley even 81-90.

- (3) The average size of the smallholder farms is 4 acres. Maize, groundnuts and pulses are the main food crops. Cotton is the main cash crop in the Henga valley, both cultivated on large-size farms and on small holdings. In Hewe, oriental tobacco is a cash crop. Furthermore, burley tobacco is grown in settlement schemes and on large-size farms. The average value of marketed agricultural production per capita ('71/72) amounts to K 2.40. About half of the farmers have cattle.
- (4) There are no food shortages. West of Thulwe, water is scarce.
- (5) Central Rumphu is well connected with the surrounding APPA. All-weather roads cross the area and the general road pattern is fairly well developed. Public transport is available throughout the year.
- (6) Almost the whole area is served by local centres. The urban centre Rumphu serves the central part of the APPA as a rural market centre.

11. Phoka.

- (1) A mountainous area with potential for the cultivation of perennial crops.
- (2) Phoka is scarcely populated, but there are small patches with densities of 50-100 p.p.s.m. Land shortages do not occur. Exact data on out-migration are not available but the sex-ratio is between 91 and 100.
- (3) The average farm size is 2-3 acres. Maize and pulses are the main food crops. Coffee is cultivated as a cash crop. The value of marketed agricultural production per capita ('71/72) amounts to K 0.70. Data on livestock in this area are not known.
- (4) There are no data about food shortages; there is no water shortage.
- (5) Phoka is connected with APPA 10 by an all-weather road, which crosses the area; there are some dry-weather cross-roads. The connections to the Karonga-Lakeshore are only suitable for small vehicles. There is a dry-weather bus route to the area.
- (6) The APPA is fairly well served by local centres.

12. Vipya North.

- (1) A mountainous area with potential for the cultivation of perennial crops.
- (2) The population density is generally low; in some places up to 50 p.p.s.m. There is no shortage of land. Exact data on out-migration are not available, but the sex-ratio is between 91 and 100.
- (3) The average farm size is 3-4 acres. The main food crops are maize and pulses, cultivated in gardens on the valley floors. Coffee is cultivated as a cash crop. The value of marketed agricultural production per capita ('71/72) amounts to K 1.60. Data on livestock in this area are not known.
- (4) There are no food shortages; there are no water shortages.
- (5) The road connections are poor; a dry-weather road links Vipya North to APPA 10; there is only one cross-road. There is a dry-weather bus route to the area.
- (6) In the APPA one does not find any service centre.

13. Vwaza.

- (1) This APPA has in some parts potential for extensive farming; some other parts consist of marshy areas.
- (2) Vwaza is almost uninhabited. The area is designated as a game reserve.
- (3) Not applicable.
- (4) Not applicable.
- (5) Vwaza is connected to APPA 10 by a dry-weather road.
- (6) There are no service centres.

14. North-West Mzimba.

- (1) This APPA has potential for the extensive cultivation of maize, groundnuts and tobacco.
- (2) The population density increases from north (5-50 p.p.s.m.) to south (up to 100 p.p.s.m.). There are land shortages reported near Mpherembe. No exact data on migration are available; the sex-ratio is 91-100 in the northern part and 81-90 in the southern part.
- (3) The average farm size is 5-6 acres. The main food crops are maize, groundnuts and pulses. Oriental tobacco is cultivated as a cash crop, mainly in the areas around Mpherembe, Lake Kazuni and Malidade. The value of marketed agricultural production per capita ('71/72) amounts to K 1.10. In the east of the APPA many smallholders have cattle.
- (4) There are no food shortages. Water forms a problem; North-West Mzimba is a very arid area. Therefore, the population is concentrated near streams, resulting in local land pressures (see 2).
- (5) The road pattern is fairly well developed. All-weather roads connect the APPA to APPA 10, 15 and 16. Dry-weather roads cross the area. The western part, which is the east bank of the South Rukuru river, is isolated. The APPA is crossed by all-season bus routes.
- (6) The area is poorly served by service centres; only the central and southern part are served by local centres.

15. Mzuzu-Mombera area.

- (1) This APPA stretches along the western and northern side of the Vipya Mountains. In some parts the area has potential for the intensive, in other parts for the extensive cultivation of maize, groundnuts and tobacco.
- (2) The population density is difficult to determine. There are no data on out-migration, but the overall sex-ratio is 91-100.
- (3) No information is available about the farming system in this area. There seems to be very little commercial agricultural production. Reportedly, many farmers, especially in the southern part, have cattle.
- (4) Contrary to data provided by Brown and Young, the area seems to be rather dry, especially in the southern part.
- (5) In the western and northern parts, all-weather roads connect this APPA to the adjoining APPAS 10, 14, 16 and 20. Large areas, however, remain isolated. Public transport is not available.
- (6) The APPA is partly served by local centres. Mzuzu, the urban centre,

which provides services to the whole region, is located in this APPA. Data on this APPA, especially those related to agricultural production, should be handled with caution since they seem to be of limited reliability. Especially on this area, further research is needed.

16. Central and South-West Mzimba.

- (1) This vast APPA has potential for the intensive cultivation of maize, groundnuts and tobacco. In the eastern part, it includes areas with potential for livestock.
- (2) In the western part of the APPA, the population density exceeds 100 p.p.s.m., but in the eastern part the density is much lower (50-100 p.p.s.m.). In general, land shortages do not occur; in the western part (lower South Rukuru River area), there is a shortage of grazing lands. In this area the West Mzimba Land Utilisation Project has been established, which also aims to improve grazing conditions. No exact data on migration is available. In the northern part, the sex-ratio is 81-90, in the remaining area 91-100.
- (3) The average farm size is 6-8 acres. The main food crops are maize, groundnuts and pulses. Oriental tobacco is grown as a cash crop. The average value of marketed agricultural production per capita ('71/72) amounts to K 1.20. Many farmers have cattle.
- (4) There are no food shortages. Shortage of water occurs in the drier eastern Perekezi-area and locally in the western part of the APPA.
- (5) This APPA has a fairly well developed road network. All-weather roads connect the area to other APPA, while the interior is opened up by dry-weather roads. Public transport is available.
- (6) The service centre pattern is poor. Only relatively small parts are served by local centres and a rural market centre (Mzimba: urban centre).

17. West-Mabulabo.

- (1) This area has in some parts potential for the intensive cultivation of maize, groundnuts and tobacco, in other parts potential for the extensive cultivation of the same crops.
- (2) The population density is rather high: 50-100 p.p.s.m. Land shortages do not occur. No exact data are available on migration; the sex-ratio is 91-100.
- (3) The average farm size is 5 acres. Maize, groundnuts and pulses are the main food crops. Oriental tobacco is cultivated as a cash crop. The value of marketed agricultural production per capita ('71/72) amounts to K 1.20. Many farmers have cattle.
- (5) The APPA has a peripheral location, implying long distances to other parts of the Northern Region. A dry-weather road crosses the APPA. In the dry season public transport is available.
- (6) The pattern of service centres is poor; only the western part is served by a local centre.

18. East-Mabulabo.

- (1) This APPA has no agricultural potential, except for a small upland area where perennial crops can be cultivated.
- (2) The area is very sparsely populated. No exact data on out-migration are available; the sex-ratio is 91-100.
- (3) Agricultural activities are almost wholly limited to the upland areas, where coffee is cultivated. Data on farm sizes are not known. Cassava, pulses and maize are the main food crops. The marketed agricultural production in '71/72 had a value of K 0.30 per capita. There is no cattle.
- (4) In the upland area, food shortages are more or less permanent. Every year food is imported.
- (5) Roads and public transport are not available.
- (6) There are no service centres in the APPA.

Planning Region C: Nkhata Bay.

Planning Region C covers the whole of Nkhata Bay district and the Lakeshore area of Rumphi district (APPA 19). This Planning Region also includes the whole Vipya Pulpwood Project. As this Project comprises some adjacent forest reserves in Mzimba district, these are included in Planning Region C as well.

Planning Region C consists of the APPA 19-23.

19. Central Lakeshore Area.

- (1) This APPA stretches from Chitimba in the north to Nkhata Bay in the south. Scarp zones steeply descend into the Lake, leaving some small vallies and river deltas with good potential for the intensive cultivation of food crops.
- (2) The area has a small population, which is concentrated in small, relatively isolated patches along the coast. In these areas very high densities may occur (> 150 p.p.s.m.). The pressure on the land is high. There is a large out-migration; the sex-ratio varies between 71 and 100.
- (3) Fishing is the main economic activity. Some cassava and vegetables are grown as food crops. The farmers do not have cattle.
- (4) The area is known for more or less permanent food shortages. Every year food is imported.
- (5) The APPA is not accessible by road; all transport has to go via the Lake.
- (6) The area is not served by service centres, except in the extreme northern and southern parts.

20. North Nkhata Bay.

- (1) A mountainous area with potential for the cultivation of perennial crops.
- (2) The population density is generally low, but locally densities exceed 150 p.p.s.m. There are no land shortages. Accurate information about migration is lacking but the sex-ratio is between 71 and 90, which points at a sizeable out-migration of men.

- (3) The average farm size is 3-4 acres. Cassava is the main food crop. Coffee is cultivated as a cash crop. The value of marketed agricultural production per capita ('71/72) amounts to K 0.20. The smallholders do not have cattle.
- (4) There are no exact data on food shortages. Water shortages do not occur.
- (5) The southern part of the APPA is crossed by all-weather roads. The northern and eastern parts are isolated. Public transport is only available in the dry season.
- (6) Only the southern part of the APPA is served by both local and rural market centres. In the northern part, there are no service centres.

21. Nkhata Bay Lowlands.

- (1) This APPA comprises both areas with potential for perennial crops and dambo areas suitable for rice cultivation.
- (2) The population density is very high (> 150 p.p.s.m.) along the Lakeshore, and decreases as distance to the Lake increases. Land shortages do not occur. In some parts of the APPA there is a sizeable out-migration of men, indicated by a sex-ratio which varies between 71 and 100.
- (3) The farm sizes are generally small (1-2 acres), as many people are involved in fishing. Cassava is the main food crop. Rice is cultivated in the dambos as a cash crop, both by individual smallholders and by settlers in the settlement scheme. Furthermore, there is a tea development area and several estates (rubber, tea) in the APPA. The value of marketed (smallholder) agricultural production per capita ('71/72) amounts to K 2.40. Cattle is absent.
- (4) There are no food shortages; no lack of water.
- (5) The APPA is well opened up by roads, both all-weather and all-season roads. Public transport is available. There are jetty facilities at Nkhata Bay.
- (6) In the APPA hardly any local centres are found. Except for the southern part, the area is served by rural market centres.

22. Vipya.

- (1) This is a mountainous area with varying potential. It has been developed into large forest areas within the framework of the Vipya Pulpwood Project.
- (2) Except for a few forestry-camps, the APPA is uninhabited.
- (3) Forestry forms the only economic activity.
- (4) Not applicable.
- (5) All-weather roads cross the outer parts of the area, while dry-weather roads opened up parts of the interior. A new road will connect the APPA with Chinteché, the future location of the pulp-mill for the Vipya Pulpwood Project. A bus route crosses the APPA in the dry season.
- (6) The APPA is served by the forestry centre at Chikangawa and some minor forestry camps.

23. Likoma and Chisumulu.

- (1) No data are available on the agricultural potential of these two isles in Lake Malawi.
- (2) The population densities are very high (> 150 p.p.s.m.). There is a sizeable out-migration from the isles to the main land; this is also indicated by the sex-ratio: 81-90.
- (3) The population is mainly involved in fishing. In addition, cassava is grown as a food crop. Cattle is absent.
- (4) The area is known for more or less permanent food shortages. Every year food is imported.
- (5) Lake transport is available.
- (6) The isles are served by a local centre.

APPENDIX II

RECOMMENDATIONS FOR PLANNING REGIONS

Recommendations for planning region Karonga-Chitipa.roads and transportation

- In view of the present pattern of production and expected expansion the following improvements in the communication system deserve priority:
 - construction of a bituminised road at Cheweta up to the escarpment in order to make heavy road transport to and from the Karonga Lake-shore possible the whole year round.
 - construction of a dry-weather road from Cheweta to Mlowe.
 - to extend the Nyungwe Looproad to beyond Bunganiro.
 - to extend the - K.R.D.P. planned - livestock development road along the Songwe via Syegati to the D3.
 - improvement of the Karonga-Chitipa road to all-weather quality for vehicles up to, at least, 15 sh. t.
 - to up-grade the D3 road to Misuku up to all-season standards.
 - improvement of the D5 from Chisenga to Nthalire to all-weather quality for vehicles up to 15 sh. t.
 - extension of the planned livestock development road from Nthalire to Kopa Kopa, via the North Rukuru valley to Mpata.
 - extension of the S7 to Kapenda with all-season quality.
 - opening of bus routes on the sections: Chitipa-Kapenda-Eponga, Chisenga-Nthalire and Chilumba-Fulirwa-Nyungwe.
 - to establish passenger-transportation on the section Kapoka-Misuku (D3).

education

It is recommended to establish primary school facilities in the areas (see map 6):

- west and north-west of Mlale
- north of Chilumba
- north-east of Misuku
- north-west of Chinunkha
- south of Chitipa

health

- According to the K.R.D.P.-plans, the capacities of the hospitals at Kaporo, Karonga and Chilumba will be increased. Their capacities, however, should at least be doubled. In addition it is recommended to increase the capacities of the hospitals at Chinunka and at Chitipa. In the long run, a rural hospital at Nthalire is proposed.
- It is recommended to shift the planned dispensary at Mwanjary (K.R.D.P.) to Syegati.
- It is further recommended to shift the planned dispensary (K.R.D.P.) between Chilumba and Chitimba to Fulirwa, as the former area is already served by Sangwilo dispensary.
- Moreover, it is proposed to establish new dispensaries at:
 - Nyungwe
 - Kapoka
 - Kopa Kopa

service centres

- The following service centres are proposed (see map 11):
 additional local centre: Lufita, Kopa Kopa, Chendo, Mpale, Eponga,
 Mlale, Syegati.
- local centres : Kameme, Kapoka, Wenya, Kapenda, Ngerenge,
 Mpata, Lupembe, Fulirwa, Chitimba.
- rural-market centre : Nthalire.

Recommendations for planning region Mzimba-Rumphi.roads and transportation

- Priority should be given to a direct all-weather road connection Mzuzu-Kasungu. In addition the following improvements deserve attention:
 - to improve the S8 (Rumphi-Mphomoha) up to all-season standards and to extend passengers-transportation to Uzumara.
 - up-grading of the track Kamteteka-Lake Kazuni, on the western side of the upper South Rukuru and connecting Euthini with this road.
 - improvement of the M1 section Bolero-Katumbi to all-weather standards.
 - up-grading of the track Luzi-Mzokoto.
 - improvement of the branchroad M1-Njuyu (D 150).
 - construction of a link between Rufu Mkunika and the S49
 - repair of the broken bridge or construction of a new bridge across the Mzimba river, in order to improve the connection between Mzimba and the area of Chisasa (D 238).
 - up-grading of the track Embangweni -Mabiri, and to establish a ferry across the South Rukuru river near Mabiri.
 - improvement of the Luwerezi-Champira section of the D 167 and opening of a busroute on this section.
 - up-grading of the branchroad connection Phembe-D 167
 - opening of a busroute on the section Chikangawa-Mzuzu

education

- For the expansion of primary educational facilities the following areas deserve priority:
 - north of Rumphi
 - north-east of Luzi
 - south-east of Mwazisi
 - north and north-east of Mpherembe
 - east of Enikweni
 - west of the South-Rukuru river
 - south of Kafukule
 - west of Mzalongwe
 - north of Mombera
 - north and east of Kamteteka
 - north and east of Edingeni
 - south of Edingeni
 - west of Mabiri
 - north-east of Embangweni
 - south of Phazi
 - south-east of Mabulabo

health

- It is recommended to increase the capacities of the hospitals at Katumbi, Embangweni, Mzimba and Rumphi, and to establish dispensaries at: Mphompha, Mwazisi, Malidade, Manyamula, Mjinge and Sauti.

service centres

The following service centres are proposed:

- additional local centre: Mzokoto, Njuyu, Kamwanga, Rufu Mkunika, Zubayumo, Mcocha, Phazi, Vazarra, Madede, Thoso, Phembe, Uzumara.
- local centres : Mwazisi, Madisi, Kapando, Mzalongwe, Bulala, Eswazini, Mjinge, Manyamula, Mabiri, Luwerezi, Kazuni, Malidade, Chisasa, Ehehleni, Mphompha.
- rural market centres : Kafukule, Champira.

Recommendations for planning region Nkhata-Bay.

- The fishery potential in Lake Malawi seems not exactly to be known. An investigation of this potential will reveal the opportunities for fishery development.

roads and transportation

- to up-grade the S45 (Timbiri-Chikwina-M14) to all-season standards as well as the existing track Chikwina-Bula-Usisya.

education

It is recommended to establish primary school facilities in the areas:

- south and east of Mzuzu
- west and south-west of Bandawe
- south of Chombe
- west and north of Nkhata-Bay

health

- It is proposed to increase the capacity of the hospital at Chintechi.
- At the long term the dispensary/maternity clinic at Usisya should be up-graded to hospital standards.
- It is recommended to establish dispensaries at: Khande, Kabunduli and Bula.
- It is proposed to provide government assistance to the tea-estate dispensary at Chombe which will enable people from outside the estate to profit from this health facility.

service centres

The following service centres are proposed:

- additional local centre: Chombe, Chisumulu, Zunga, Bula.
- local centres : Timbiri, Chinyakula, Maula, Khando, Dwambazi (C.R.), Tukombo, Ruarwe, Usisya.

BIBLIOGRAPHY

- Africa Research Bulletin, Economic, Financial and Technical Series, Vol.11, no.9, October 31, 1974, p 3253 and p 3292.
- Agricultural Sector Review, Malawi. Document of International Bank of Reconstruction and Development Association, East Africa Regional Office, December 28, 1973.
- Appraisal of the Karonga Rural Development Project, Phase I Document of IBRD/IFC/IDA
- Chambers, R. Settlement Schemes in Tropical Africa, A study of organisations and development, London, 1969.
- Compendium of Agricultural Statistics, Zomba, 1971.
- Dusseldorp, D.B.W.M.van Planning of service centres in rural areas of developing countries, Wageningen, 1971.
- Economic Report Malawi, 1973.
- Ellman, A.O. Tanzania's attempts at introducing agricultural improvements through co-operative farming. East African Journal of Rural Development, 1970, Vol. 2.
- Hoyle, B.S. (ed.) Spatial Aspects of Development, London, 1974.
- Malawi Population Census 1966, Final Report, Zomba 1968.
- Master Plan for Lilongwe, The Capital City of Malawi, 1968.
- Ministry of Agriculture and Natural Resources Malawi Crop Potentials 1965-1985, Zomba.
- " " Mbawa. A farm management survey among oriental tobacco, maize and groundnut growers in the Mbawa area in the southern part of Mzimba district, Malawi. Agro-Economic Survey, Lilongwe, 1973.
- " " Mbawa. A sample farm management survey of agricultural households near Mbawa in Mzimba District Malawi, Agro-Economic Survey, Zomba 1971.

- | | |
|--|--|
| Ministry of Trade,
Industry and Tourism | Small scale Industry for Malawi, mimeo,
February 1973. |
| Mosher, A.T. | Getting Agriculture Moving, New York, 1966. |
| - | National Sample Survey of Agriculture
1968/69, Zomba, September 1970. |
| Office of the President
and Cabinet | Statement of Development Policies 1971-
1980, Economic Planning Division, Zomba,
December 1971. |
| Quinten, K. and
Sterkenburg, J. | Marketing of Smallholder Produce in Malawi,
2 Vols. Agro-Economic Survey report,
Ministry of Agriculture, Lilongwe, 1975. |
| Seers, Dudley. | What are we trying to measure? In Nancy
Baster (ed.). Measuring Development, The
Role and Adequacy of Development Indicators,
London, 1972. |
| Young A, and Brown, P. | The Physical Environment of Northern Nyasa-
land, Zomba, 1962. |