



**PART THREE**

***Integrated Development Plans***

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# PLANNING FRAMEWORK

## General

In the formulation of this Kilimanjaro Region Integrated Development Plan it has been necessary to provide a systematic frame for the purpose of making the planning integrated and long-term and capable of encompassing a wide area. The following pages will be devoted to a description of this frame or of the rules that have been abided by throughout the planning by all those involved in it in terms of scope, structure, and procedure.

## The Scope of the Planning

The physical scope of the planning has been determined by the area and the period to be covered by the plan. The area involved is the whole Kilimanjaro Region, encompassing 13,209 km<sup>2</sup>, which has been arranged into seven hierarchical levels as follows corresponding to different planning needs and to different degrees of planning depth:

- 1) National level  
For comparison between the Kilimanjaro Region and other regions.
- 2) Northern regions level  
For land-use, water resources, transportation and communications, and energy network planning over a wider area encompassing not only the Kilimanjaro Region but also the neighboring Tanga and Arusha regions.
- 3) Regional level  
For formulation of a regional development master plan on the basis of maps on a scale of 1:250,000.
- 4) District level  
For formulation of a development plan for each of the four districts of the region on the basis of maps on a scale of 1:100,000.
- 5) Division level  
For preparation of ecological, community, and other plans on the basis of maps on a scale of 1:50,000.
- 6) Ward level  
For population allocation, intervillage public facility allocation, and other planning.
- 7) Village level  
For determination of size of basic village units.

Besides this hierarchical arrangement along administrative lines, the following types of zoning have been utilized in physical planning fields:

- 1) Land zoning  
This zoning broadly divides the region into high-land areas, upper lowland areas, and lowland areas for land-use planning purposes.
- 2) Human settlement zoning  
This zoning classifies the region into urban areas and rural areas on the basis of population density and the structure of industry for population and industrial allocation and infrastructural planning purposes.

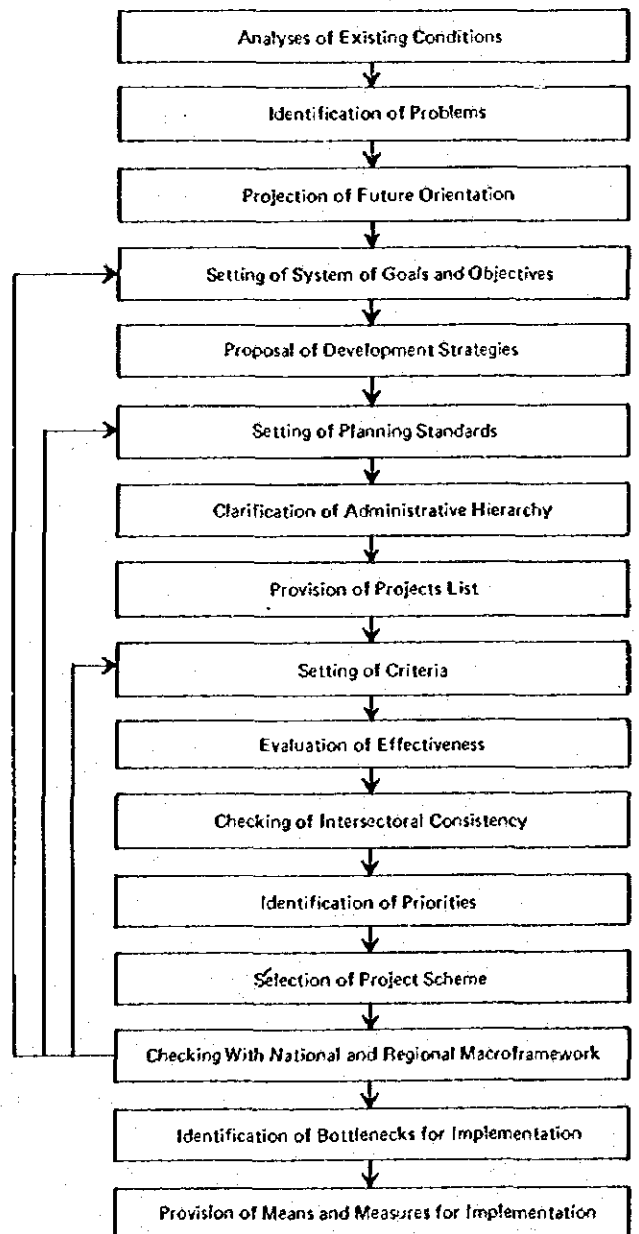
As for the period to be covered by the plan, the first year is 1977 and the final target year is 1995, the interim being divided into four phases as follows:

Phase	Duration
Phase One	1977-80
Phase Two	1981-85
Phase Three	1986-90
Phase Four	1991-95

## The Procedure of the Planning

The overall procedure that the planning has followed is summarized in the chart below.

### Planning Procedure



# DEVELOPMENT PROJECT LIST

Project	Development budgets (1,000 sh.) 1977/78-80/81	Development budgets (1,000 sh.) 1981/82-85/86	Remarks	Project	Development budgets (1,000 sh.) 1977/78-80/81	Development budgets (1,000 sh.) 1981/82-85/86	Remarks
<b>1. Agriculture</b>	69,305	101,262	See P. 82, 83, 84, 85, 86, 87.	<b>7. Transportation</b>	220,384	387,109	See pp. 122-125
Irrigation	41,800	61,030	Existing farm land 2,120 ha, area to be newly cultivated 1,000 ha, newly irrigable area 2,040 ha, 11 project sites.	Road improvement	133,780	167,362	Road improvement and rehabilitation; regional main roads, 214 km by 1980 and 125 km by 1985; distributor roads, 251 km by 1980 and 287 km by 1985.
Pangani Basin			Existing farm land 1,440 ha, area to be newly cultivated 1,760 ha, 4 project sites.	Road maintenance	53,275	71,500	Number of additional buses: 20 by 1980 and 52 by 1985.
Mkomazi Valley			Existing farm land 3,200 ha, 4 project sites.	Bus service	3,622	4,342	Locomotive availability: 57% by 1980 and 75% by 1985.
Extension services	17,700	25,840	Agricultural technical center, seed multiplication farm, mechanical service center, etc.	Railway	29,707	143,905	
Crop production	1,675	2,445	Rice, vegetables, cotton, coffee, etc.	<b>8. Communications</b>	21,109	56,150	See pp. 126-127
Livestock	8,130	11,947	Technical guidance institute, beef cattle center, dairy farming center, etc.	Telecommunications	20,309	54,950	Construction of new telephone exchanges: 7 by 1980 and 9 by 1985.
<b>2. Water Resources</b>	8,400	-	Reference: P. 88, 89, 90, 91	Postal service	800	1,200	Construction of new post offices: 12 by 1980 and 18 by 1985.
Investigation	2,400	-	Total investigation area 510 km <sup>2</sup> , 5 areas.	<b>9. Town</b>	143,374	261,650	See pp. 106-109
Topographical mapping	6,000	-	South Pare mountains mapping area 540 km <sup>2</sup> .	Land supply	38,400	62,400	Preparation of residential sites: 87 ha (1,200 lots) by 1985 and 145 ha (2,000 lots) by 1985.
<b>3. Manufacturing</b>	9,395	9,660	Reference: P. 92, 93, 94, 95	Housing supply	50,400	114,000	Construction of public housing: 640 units by 1980 and 1,200 units by 1985.
Kilimanjaro industrial development center	9,395	762	In Moshi Town	Urban facilities	5,750	13,500	Construction of community centers, wheelbases facilities, open-air markets, etc.
Other manufacturing	-	8,898	General industrial development	Roads and streets	36,400	51,600	Extension of roads and streets: 24.5 km by 1980 and 32 km by 1985.
<b>4. Forestry</b>	29,090	8,050	See pp. 96-97	Sewage service	12,424	20,150	Percent of urban population serviced: 42% by 1980 and 51% by 1985.
Afforestation of steep slopes	1,550	1,550	50 km <sup>2</sup> on southern slopes of North Pare mountains, for prevention of landslides.	<b>10. Villages</b>	9,107	13,210	See pp. 110-113
Afforestation of banks of steeply sloped rivers	790	790	26 km <sup>2</sup> on southern and eastern slopes of Mt. Kilimanjaro, for prevention of washing away of soil and stabilization of river banks.	Lowland villages	1,707	2,610	Construction of new villages at Lower Mochi, Mkomazi Valley, Pangani Basin and Nyumba ya Mungu.
Afforestation of areas along national highways	410	410	12 km <sup>2</sup> on southern slopes of Mt. Kilimanjaro, for prevention of flood damage.	Pilot villages	7,400	10,600	Rehabilitation of five existing villages at pilot villages.
Development of production forests	26,340	5,300	80 km <sup>2</sup> in lowlands of Mochi District.	<b>11. Public Utilities</b>	107,034	153,495	See pp. 126-131
<b>5. Game Conservation</b>	2,755*	7,660*	See pp. 98-99	Electricity supply	18,202	20,550	% of population serviced: 2.8% by 1980 and 6.5% by 1985.
Wildlife survey	1,810	270	Survey of wildlife, domestic animals, human land utilization, and water resources.	Urban water supply	27,833	50,825	% of population serviced: 75% by 1980 and 92% by 1985.
Construction of boreholes	810	1,350	One hole per year	Rural water supply	61,000	82,120	% of population serviced: 66% by 1980 and 87% by 1985.
Visitor facilities	-	5,905	Youth center and visitor rooms.	<b>12. Social Services</b>	45,775	67,975	See pp. 114-120
<b>6. Tourism</b>	18,371	15,397	*Including 135,000 sh. in foreign aid and the cost of training of rangers overseas.	Medical and health	11,420	21,870	Construction of 5 new hospitals and 4 new dispensaries by 1985.
Kilimanjaro Airport	18,371	15,397	See pp. 100-101	Primary schools	23,546	25,290	Construction of 26 new schools by 1980
Tourism center complex	-	-	Construction of the building near existing Kilimanjaro Airport.	Secondary schools	3,480	11,946	Expansion of existing schools (115 new classrooms by 1980)
				Adult education and family life	7,329	8,869	Construction of 4 regional community centers by 1980.
<b>Totals</b>	<b>678,984</b>	<b>1,072,059</b>					

## ECONOMIC MACROFRAME

### Macroframe

The macroframe should not be regarded, strictly speaking, as a target of the plan but rather as a check for the acceptable volume of development activity envisioned by the plan since there are various problems, particularly regarding reliability and availability of the basic data required for analyses and programming. Estimated GRP of the Kilimanjaro Region in 1975, the initial base of the plan is given as follows.

#### Estimated Economic Macroframe, 1975 Prices

	Sectoral distribution(%)			Rate of growth(%)	
	1975	1980	1985	75-80	80-85
Agriculture	67.1	63.0	57.8	5.1	5.1
Mining	2.3	1.9	1.5	2.5	2.0
Manufacturing	4.7	6.1	8.4	12.0	14.0
Electricity and water	1.2	1.7	2.6	14.0	16.0
Construction	2.3	2.9	4.1	12.0	14.0
Trade	10.1	10.9	11.5	8.0	8.0
Transportation and communications	1.7	2.0	2.3	9.5	10.0
Services	10.5	11.4	11.9	8.0	8.0
Totals	100.0	100.0	100.0	6.4	7.0
GRP (millions of shillings)	1,140.1	1,553.0	2,173.6	-	-
Population (thousands of persons)	865	1,022	1,193	3.4	3.1
Per-capita GRP	1,318	1,520	1,822	2.9	3.7

GRP, including subsistence production, is expected to grow at a rate of 6.4% a year in 1975-1980 and 7.0% in 1980-1985, averaging 6.7% in 1975-1985. This will be higher than the national economic growth rate. Per capita GRP should be 1520 sh. (US\$183) in 1980 and 1822 sh. (US\$220) in 1985 at 1975 prices. The primary sector should account for 57.8% in 1985, compared with 67.1% in 1975. The percentage accounted for by the secondary sector should rise from 10.5% in 1975 to 16.6% in 1985. That accounted for by the manufacturing sector, however, should still be only 8.4% in 1985 in spite of a high growth projection, as compared to 10.6% in 1975.

According to the population projection, the number of persons of age 15 years and over will reach 611,500 in 1980 and 604,000 in 1985 from 440,900 in 1975, for an annual rate of increase of 3.2% in 1975-1985. The total labor force in the region is expected to be 340,200 in 1980 and 409,900 in 1985 vs. 282,300 in 1975 on the assumption that the laborization factor will slightly rise along with urbanization and intensification of production motivation of the people in the region in spite of an increase in the percent of the population receiving schooling. This means some 127,600 persons will enter the regional labor force in 1975-1985.

Although the rate of increase in productivity applied in the projection might seem rather low, it should be a major task in the plan to create new jobs for 123,000 persons in the region in the period up to 1985. Assuming the proposed economic growth and rise in productivity, the rate of unemployment in the region should decline from 9.4% in 1975 to 3% in 1985. Considering the productivity gap between agriculture and manufacturing, rapid transformation of the industrial structure, however, is not expected.

### Projected Employment

	Sectoral distribution (%)			Rate of increase (%)		Rate of increase in productivity	
	1975	1980	1985	75-80	80-85	75-80	80-85
Agriculture	81.6	80.0	77.5	3.4	3.3	1.7	1.8
Mining	0.4	0.4	0.3	1.0	1.0	1.5	1.0
Manufacturing	4.4	5.5	7.1	8.2	9.6	3.8	4.4
Electricity and water	0.3	0.3	0.3	3.6	1.8	10.4	14.2
Construction	0.5	0.6	0.9	9.8	10.7	2.2	3.3
Trade	2.4	2.5	2.5	4.9	3.9	3.1	4.1
Transportation and communications	1.7	1.8	1.9	4.8	4.8	4.7	5.2
Services	8.6	8.9	9.5	4.2	5.6	3.8	2.4
Total or average	100.0	100.0	100.0	4.3	4.3	2.1	2.7
Total employment (1,000 persons)	250.6	301.8	366.8				
Unemployment (1,000 persons)	26.0	20.5	11.3				
Rate of unemployment (%)	9.4	6.4	3.0				

Considering the productivity gap between agriculture and manufacturing, rapid transformation of the industrial structure is not get feasible. This means that an agriculture-oriented structure will have to be retained in spite of a slight decline in the relative weight of agriculture in the regional economy. Productivity gap between agriculture and manufacturing, which is a significant indicator from the viewpoint of incentive for transformation of industrial structure, is shown as follows.

Agriculture = 100	1975	1980	1985
Agriculture	100	100	100
Manufacturing	130	146	168
Total	122	127	136

The cumulative total of fixed capital formation in the region in 1977-1985 is expected to be approximately 2.8 billion shillings in 1975 prices, assuming an investment rate of 13% of GRP in 1977-1980 and 22% in 1981-1985 and an annual increase of 6.7% in GRP during the same period. During the same period, cumulative public investment capacity should be around 1.8 billion shillings in 1975 prices, assuming a public investment rate of 11% of GRP. In this case it should be noted that the total economic capacity includes subsistence.

## SOCIAL PLANNING FRAME

### Goals of Social System Planning

Integrated development plans for regions, cities, and so on, are all by nature social system plans regardless of the particular planning methodology employed, and generally social system plans strive ultimately for an increment in welfare no matter what kind of community is involved. This concept of "welfare," which serves as both a measure for appraisal and a planning goal in itself, is a very broad concept which has to be delineated more precisely in each case by the state and structure of the social system for which the planning is being done. The social system embodies six basic processes: production, consumption, protection, learning, decision making, and interaction. The health of the social system depends on good balance and linkage between its basic processes and between its sub-systems.

The state of the social system of the Kilimanjaro Region to be attained through the Third 5-year Plan should be considered as no more than a milestone on the road toward greater long-term development. In the table below the state of the social system of the region in 1976 is given in the left-hand column, the short-term targets to be achieved by 1980 in the middle column, and the long-term targets to be achieved by 1995 in the right-hand column. The table indicates the main indicators for each of the basic processes of the social system, and more detailed targets are explained later on together with the projects to which they are respectively related.

### Objective Indicators

	Present Conditions		1980	1995	Remarks
	Kilimanjaro	All of mainland			
<b>Production</b>					
Per-capital annual income	1,318 (1975)	1,020 (1974)	1,520	3,080	sh. in 1975 prices
Unemployment rate	9.3		6.4	5.0	%
<b>Consumption</b>					
Calorie intake	2,520 (1968)		2,700	2,700	calories/person/day
Protein intake	42 (1968)		50	50	grams/person/day, FAO reference proteins
Coverage of piped water supply	39.4		66.7	100	%; population serviced/total population
Coverage of electricity supply	1.9		2.8	15.9	%; no. of households serviced/total no. of households
Electricity consumption	18.5		27.3	53.8	KWH/person/year
Expenditures on clothing	36		70	180	sh./person/year
<b>Learning</b>					
Average years of formal education	2.86 (1973)	2.28 (1973)	3.45	5.8	
Literacy rate	64 (1975)	61 (1975)	75	95	%
Secondary school enrollment rate	14.3 (1976)	9.9 (1975)	15	25	%; no. of Form I students/no. of Standard VII pupils
Primary school pupil/teacher ratio	49.6 (1976)	53.2 (1975)	49.6	40	
<b>Protection</b>					
Protein and/or calorie deficiency	5.3 (1968)		4	0	% of children under five with severe protein and/or calorie deficiency
Population per hospital bed	621	826	475	300	
Population per dispensary	7,840	8,030	5,870	4,180	
Infant mortality rate	13.0 (1973)	15.2 (1973)	11.8	10.8	%
Life expectancy	51 (1973)	47 (1973)	52	55	
<b>Interaction</b>					
Interregional migration (in)	2.2		0	0	%
Interregional migration (out)	3.9 (1967)		0	0	%
Newspaper subscription rate	10		15	55	%; no. of subscribers/total no. of households
Telephone subscription rate	4.2	4.0 (1974)	6.0	20.7	no. of telephones/thousand persons
Rate of coverage all-weather roads	80.6		90	98	%; population within 5 km of road/total population
Roads paved	26.4		32	70	% of total mileage of district-A and higher grade roads
No. of automobiles	3,500		6,700	35,000	
<b>Decision-making</b>					
Community center	0	0	4	19	

## LAND-USE BLOCKS

### Agricultural Area

The net agricultural acreage of the region is 1,630 km<sup>2</sup>, and the gross agricultural acreage 1,990 km<sup>2</sup>, which includes housing lots, farm roads, irrigation channels, etc., and accounts for about 15% of the total area of the region. Approximately 70%, or 1,130 km<sup>2</sup>, of the net agricultural acreage is accounted for by smallholders, the remaining 30% being cultivated by cooperatives or by public corporations in the form of large-scale estates. The table below gives, by district, the net agricultural acreage (cultivated area), the rate of cultivation, the cultivated area per household, etc.

	Hai	Moshi	Rombo	Pare	Totals
Total area (km <sup>2</sup> )	2,109.9	1,764.1	1,435.0	7,900.0	13,209.0
Cultivable land	1,516.3	1,346.7	502.4	5,012.9	8,378.2
	(71.9%)	(76.3%)	(35.0%)	(63.5%)	(63.4%)
Land already under cultivation	602.1	541.0	354.7	444.4	1,942.2
Smallholder cultivation	286.6	337.3	354.0	376.4	1,354.3
Estates	315.5	203.7	0.7	68.0	587.9
Rate of cultivation	39%	17%	25%	25%	25%

### Smallholdings

At the present time a full 94% of the households in the region are smallholding households, and the members of these households represent 91% of the total population of the region of 865,000 persons. The land cultivated by them — approximately 1,415 km<sup>2</sup> — accounts for 10.7% of the total area of the region and can be classified into the following three categories according to land-use type: 1) high-density cultivation in highland areas, 2) cultivation by smallholders in upper lowland and footland areas, and 3) extensive (as opposed to intensive) cultivation and grazing in lowland areas. Each type is profiled below.

#### 1) High-density cultivation in highland areas

In areas at altitudes of 4,000 — 6,000 ft. on the southern and eastern slopes of Mt. Kilimanjaro and 4,000 — 5,000 ft. in the Pare highlands which have the most favorable natural conditions in the region for both agricultural production and the living environment, including annual rainfall in excess of 1,000 mm, cultivation by smallholders assumes the following characteristics.

Both cultivation and housing are very dense, especially in the Mt. Kilimanjaro area, with a cultivation rate of 80%, a population density of 620 persons/km<sup>2</sup>, and gross agricultural acreage of 0.66 ha/household.

Approximately 65% of all of the smallholders in the region are settled in these areas and engaged in cultivation of coffee and bananas. Some of them also engage in stall-feeding dairy cattle raising, each household having several cows, and some of them also have land in lowland areas on which they grow maize and grass from which they make hay for their cattle.

In these areas the ample seasonal rainfall and suitable gradients (4 — 8 deg. on Mt. Kilimanjaro and 4 — 15 deg. in Pare) have made it possible to develop irrigation to a considerable extent for protection against drought in the

dry season, approximately 35% of the cultivated land in them being covered by such irrigation systems.

In order to cope with growing population and increasing demand for land, it is necessary that measures be adopted for maximum and most effective use of all of the land available in these areas since they are the best endowed areas in the region in terms of the quality of the land itself and the extent to which irrigation, road, and other networks have already been developed.

#### 2) Cultivation by smallholders in upper lowland and footland areas

The following are the characteristics of cultivation by smallholders at altitudes below 4,000 ft. on the slopes of Mt. Kilimanjaro and primarily in footland areas in the Pare District in which annual rainfall averages 700 mm.

The rate of cultivation is 35%, the population density 60 persons/km<sup>2</sup>, and the gross agricultural acreage 2.72 ha/household, which respectively represent 50%, 10%, and 400% of the corresponding figures for the highland areas.

Approximately 25% of all of the smallholders in the region are settled in these areas and are engaged in mixed cultivation of mainly maize and beans. Approximately 20% of them also raise a score or two of meat cattle, goats and other livestock by grazing.

The cultivated land is basically distributed along the irrigation channels leading from the highland areas and along the courses of rivers, a major problem being evaporation and seeping underground of these waters in the dry season.

Another problem is the fact that settlement in these areas is rather scattered, which makes for low efficiency of production and social infrastructure, and correction of this situation is a major task involved in the land-use planning.

#### 3) Extensive cultivation and grazing in lowland areas

The following are the characteristics of cultivation by smallholders in flat areas below 2,500 ft. at the base of Mt. Kilimanjaro, where the annual rainfall is below 500 mm, and in the Mkomazi and Pangani blocks of the Pare District and adjacent areas of the footland block.

The rate of cultivation is 6.0%, the population density 25 persons/km<sup>2</sup>, and the gross agricultural acreage 1.27 ha/household, which respectively represent 0.8%, 0.4%, and 200% of the corresponding figures for the highland areas.

Approximately 3% of all of the smallholders in the region are settled in an extremely localized fashion in these areas, cultivating maize, beans, cotton, and other crops which are strongly drought resistant and making use of swampland grass for grazing.

What is needed here in terms of land-use planning is the discovery of locations in these wide areas which are suitable for intensive cultivation because of relatively good water and soil conditions.

## Estates

There are 81 large agricultural estates in the region run either privately or by public corporations and covering a total area of approximately 500 km<sup>2</sup>, which represents 4% of the total area of the region and 15% of its existing cultivated area. They are located along the regional and trunk roads running between altitudes of 2,500 ft. and 4,000 ft. on the slopes of Mt. Kilimanjaro from 01 Mológ in West Kilimanjaro, through lower Moshi, and on to Himo as well as along the Same road in the footland areas on the west side of the Pare mountains.

## Reserved Area

### 1) Kilimanjaro National Park

The Kilimanjaro National Park has an area of 756 km<sup>2</sup>, or 5.7% of the total area of the Kilimanjaro Region, and extends upwards of approximately the 9,000 ft. line on the slopes of Mt. Kilimanjaro.

This national park, along with the neighboring Mt. Meru National Park, is a valuable asset in the northern Tanzanian tourism sphere and as such comes under the direct jurisdiction of the Ministry of Natural Resources and Tourism. The mountain reaches an altitude of 19,340 ft. at its highest peak, which is the highest point in Africa. A permanent glacier caps the upper portion of the park, and in the park there is complete protection of the terrain and of the primeval flora and wildlife.

For the more than 4,000 visitors who climb the mountain each year, there are five ascent routes, eleven huts and shelters, and two hotels at Marungu, the main base camp. No settlement or other use of this area is allowed, except for the control activities of the park staff.

### 2) Game reserve and game control areas

There are 2 game reserves in the Kilimanjaro Region: the Kilimanjaro Game Reserve (1,790 km<sup>2</sup>) and the Mkomazi Game Reserve (1,940 km<sup>2</sup>). They come under the jurisdiction of the Department of Game of the Ministry of Natural Resources — the former as an area for protection of mountain wildlife above the 6,000 ft. line on Mt. Kilimanjaro, and the latter as an area for the protection of savanna wildlife at altitudes below 3,000 ft. As in the case of the Kilimanjaro National Park, settlement and other land uses are not allowed in these areas.

### 3) Forest reserves

There is great diversity in the region with respect to terrain and climatic conditions and hence also with respect to vegetation, the pattern of distribution of which basically follows altitude lines.

Forests, woodlands, thickets, and the like are distributed almost entirely between 6,000 ft. and 9,000 ft. on the slopes of Mt. Kilimanjaro and above 4,000 ft. in the Pare zone, their total area amounting to approximately 2,110.0 km<sup>2</sup>, or 16% of the regional total. Of this 1,256.9 km<sup>2</sup>, or 60% has been designated as forest reserves for both natural conservation and forest production, the former consisting of such functions as nurturing of water resources and prevention of soil erosion and landslides.

At present there are 24 such forest reserves in the region covering 9.5% of the regional total, which is somewhat lower than the 14.5% that all forest reserves in Tanzania represent of the total national area.

## Mt. Kilimanjaro Area Zones

The Mt. Kilimanjaro area has been divided into the five zones below on the basis of altitude, annual rainfall, terrain, soil, agricultural products, population density and other conditions:

- Alpine zone
- Forest zone
- Highland zone
- Upper lowland zone
- Lowland zone

### 1) Alpine zone

The belt between 9,000 ft. and 16,000 ft. is covered by alpine meadows with alpine and sub-alpine vegetation. Above that is an ice cap. The slope is steep, varying from 10.0 deg. to 25.0 deg. Since there is little precipitation, this zone is not a source of water for the lower slopes of the mountain. The ice cap, the most splendid in Africa, has a symbolic value and can be considered as a major tourism resource.

### 2) Forest zone

This is the belt roughly between the altitudes of 6,000 ft. and 9,000 ft. on Mt. Kilimanjaro. It is presently a designated forest reserve area with both primeval and planted trees. Since its slopes are very steep, the range being 6 – 13 deg., and the air temperature is low, no coffee or bananas can be grown in this zone.

The trees in this zone are not only potentially important in terms of the forestry industry but also important in terms of retention of water for agricultural and household use in the extensive highland, upper lowland and lowland areas of Mt. Kilimanjaro. The future land use of this zone will have to be such as to effect compatibility between forestry development and protection of primeval forests and between wildlife protection and protection of primeval forests since the zone is also a designated game reserve area.

### 3) Highland zone

This is the belt roughly between the altitudes of 3,500 ft. and 6,000 ft. on the slopes of Mt. Kilimanjaro. The annual rainfall here averages 1,000 mm, the slope is gentle (3 – 8 deg.), and the soil, of the ferruginous tropical type, is deep, has a high clay content, and developed from basic rock and volcanic ash. Most of the region's coffee and bananas, both representative of the region's agriculture, are grown in this zone. Moreover, with an air temperature range of 15 – 25°C on the average, this zone has a very comfortable climate for habitation, which explains why 440,000 persons, mostly smallholders, or 50% of the population of the region, live here on an area of 706 km<sup>2</sup>, or 5% of the area of the region, for a very high population density of 620 persons per square kilometer and a very high rate of cultivation of the land of 81%.

### 4) Upper lowland zone

This is the belt roughly between the altitudes of 2,500 ft. and 3,500 ft. on the slopes of Mt. Kilimanjaro, i.e., the belt below the highland zone. The annual rainfall here is more than the 500 mm minimum required for crop farming and in some places reaches 1,000 mm. The slope is gentle (1 – 3.5 deg.), and the soil is similar to that of the highland zone, except for a higher base content which restricts its use for agricultural purposes. The

population density is 114 persons per square kilometer, and with a 45% rate of cultivation of the land, this zone is second only to the highland zone in terms of agricultural development to date. The main crops are maize, finger millet and beans grown by smallholders and coffee and sugar grown on estates which have made infrastructural investments for intensive agriculture. In addition, in West Kilimanjaro there is a government-operated dairy farm as well as several large wheat farms.

#### 5) Lowland zone

This zone comprises the semi-dry savanna grassland areas on the lower skirts of Mt. Kilimanjaro where the annual rainfall is under 500 mm and the mountain exerts hardly any ecological influence.

Although the soil is for the most part unsuitable for agricultural use and the air temperature is high, some places in this zone have good enough soil, water and other conditions to make it worthwhile to invest in the infrastructure necessary for land development.

### Pare Mountains Area Zones

#### 1) Pare mountain zone

This zone consists of the three mountain areas running in a northwest-southeast direction in the middle of the Pare District with an altitude range of 3,000 – 6,000 ft. for the most part and a peak altitude of 8,080 ft. The annual rainfall is 700 – 1,200 mm, and the slope is generally much steeper than in the highland zone of Mt. Kilimanjaro as well as much more irregular. As in the Kilimanjaro highland zone, the main crops are coffee and bananas. Owing, however, to the limitations set by the natural conditions, the population density is only 85 persons per square kilometer, or 14% of that of the Kilimanjaro highland, and the rate of land cultivation is only 8%, or about one-tenth that of the Kilimanjaro highland.

#### 2) Pare footland zone

This zone consists of the almost flat areas at the foot of the Pare mountains, ranging in altitude from 2,500 ft. to about 3,500 ft. for the most part. The annual rainfall here is 500 – 700 mm, or above the agricultural minimum, and the slope is a very gentle 1 – 3.5 deg. The soils are primarily saline. The river water flowing down from the mountains and underground water are used for maize, sisal and banana production. The population density of 27.1 persons per square kilometer is slightly higher than that of the lowland zone of Mt. Kilimanjaro, while the rate of land cultivation, at 18%, is somewhat lower. In view of the natural conditions and other considerations, this zone is promising in terms of land development possibilities, particularly for agricultural uses.

#### 3) Pare lowland zone

#### • Mkomazi

This area, a continuation of the Tsavo area in Kenya, is a savanna area with bushes and scattered trees and has a high wildlife potential in terms of giraffes, zebras, gazelles and other animals. In fact, 82% of it has already been designated as a game reserve. Although there are scattered agricultural villages in the vicinity of Lake Jipe, agricultural development of this zone is not very advisable in terms of wildlife conservation and preservation of the natural scenery.

#### • Pangani

This area is that part of the Masai steppe lying east of the Pangani River. Although there are some bush and scattered tree areas as well as some swampland, most of it consists of semi-arid areas. Presently about 91% of the zone has been designated as game control area. The altitude range is 2,500 – 3,000 ft., and the ground is almost entirely flat. With an annual rainfall of less than 500 mm, very little of the land is used for crop farming, although there are four irrigation project villages along the Pangani River in which bananas, maize and other crops are being grown. Furthermore, it should be worthwhile developing more land for agricultural use in localized areas where the productivity potential is high enough.

### 21 Blocks

Since the Mt. Kilimanjaro area has three administrative districts, its five zones have been divided into thirteen blocks so that no block other than the alpine block, which represents an integral unit as a national park, will include land in more than one district. Moreover, although the Pare Mountains area consists of only the Pare District, it, too, has nevertheless been divided into eight separate blocks for the sake of convenience, for a total of twenty-one blocks in the region.

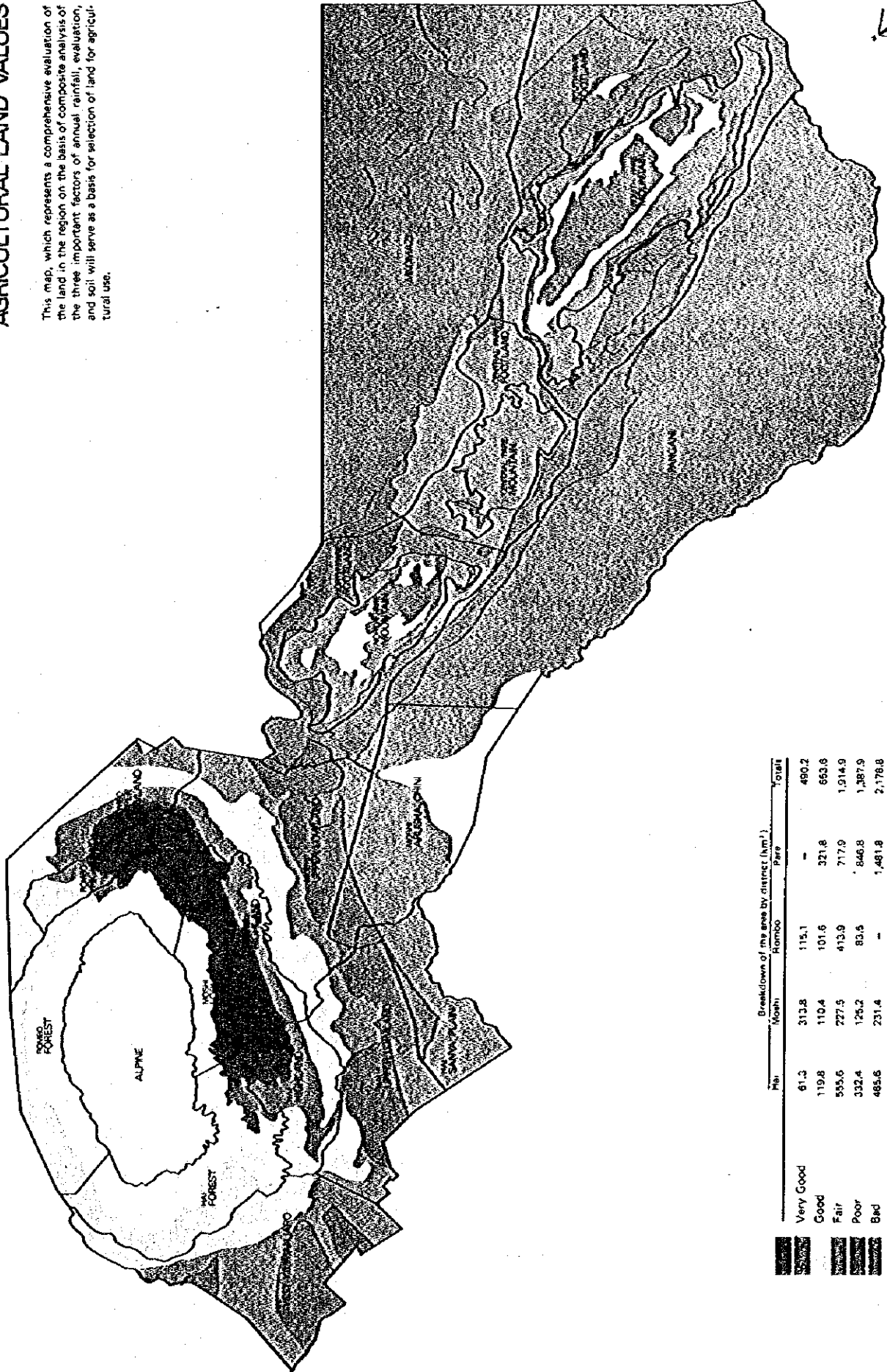
### Breakdown of the Area by Land-Use Blocks

	Total area (km <sup>2</sup> )	Total pop. (persons)	Major land use
<b>Alpine Zone</b>	756.0	—	National park
Alpine block	756.0	—	
<b>Forest Zone</b>	1,034.0	—	Forest and game reserve
Hai forest block	426.5	—	
Moshi forest block	192.6	—	
Rombo forest block	414.9	—	
<b>Highland Zone</b>	706.8	440,060	High-density cultivation area
Hai highland block	216.6	100,260	
Moshi highland block	297.3	242,800	
Rombo highland block	192.9	97,000	
<b>Upper Lowland Zone</b>	1,859.7	212,560	Cultivation area
Hai upper lowland block	494.0	38,360	
West Kilimanjaro block	532.4	13,600	
Moshi upper lowland block	500.2	111,300	
Rombo upper lowland block	333.1	49,300	
<b>Lowland Zone</b>	972.5	18,000	Nonintensive cultivation and grazing
Sanya plain block	276.9	6,200	
Arusha Chini block	695.6	11,800	
<b>Pare Mountain Zone</b>	1,450.0	123,420	High-density cultivation area
North Pare block	358.8	49,000	
Central Pare block	196.2	9,920	
South Pare block	895.0	64,500	
<b>Pare Footland Zone</b>	1,891.2	51,180	Cultivation area
North Pare block	491.9	9,500	
Central Pare block	249.3	4,300	
South Pare block	1,150.0	37,380	
<b>Pare Lowland Zone</b>	4,538.8	17,700	Game reserve some cultivation
Mkomazi block	2,051.8	1,600	
Pangani block	2,487.0	16,100	Nonintensive cultivation and grazing
<b>Totals</b>	<b>13,209.0</b>	<b>865,000</b>	



# AGRICULTURAL LAND VALUES

This map, which represents a comprehensive evaluation of the land in the region on the basis of composite analysis of the three important factors of annual rainfall, evaluation, and soil will serve as a basis for selection of land for agricultural use.



## LAND-USE REQUIREMENT AND LAND AVAILABILITY

### Agricultural Acreage Requirements

As population grows and demand for food increases, the proportion of farmland in the region's land-use pattern, in which agriculture is already predominant, will have to increase still further. The following is an estimate of what the demand for food crop acreage and cash crop acreage will be.

#### 1) Crop production targets

The table below gives the production targets for 1985 and 1995 for food and cash crops.

	Production in average year	Production targets	
		1985 ('75-'85)	1995 ('85-'95)
Food crops (tons)	393,023	639,010 (1.63)	816,230 (1.27)
Cash crops (tons)	79,667	119,320 (1.50)	136,550 (1.14)

#### 2) Yield targets

The table below gives the target yields for food and cash crops (kg/ha) for 1985 and 1995 as set on the basis of actual yields in the period 1966-1975.

	Yield in average year	Target yields	
		1985 ('75-'85)	1995 ('85-'95)
Food crops (kg/ha)	26,364	34,933 (1.33)	40,825 (1.17)
Cash crops (kg/ha)	12,517	16,023 (1.28)	18,326 (1.14)

#### 3) Net agricultural acreage requirements

The following table gives the net agricultural acreage requirements for 1985 and 1995 as determined by the crop production targets set in 1) and the yield targets set in 2) above.

	Net agricultural acreage, 1975	Acreage requirements	
		1985 ('75-'85)	1995 ('85-'95)
Food crops (km <sup>2</sup> )	1,146.3	1,789.5 (1.56)	2,764.5 (1.54)
Cash crops (km <sup>2</sup> )	481.6	515.7 (1.07)	536.5 (1.04)

#### 4) Gross agricultural acreage requirements

The table below gives the gross agricultural acreage requirements for 1985 and 1995, "gross agricultural acreage" signifying not only the acreage actually under cultivation (net acreage) but also the area taken up by rural housing, roads, irrigation channels, permanent pastures, etc.

	1975	1985 (Increase over '75)	1995 (Increase over '85)
Net agricultural acreage (km <sup>2</sup> )	1,627.9	2,230.2 (602.3)	3,301.1 (1,070.9)
Gross agricultural acreage (km <sup>2</sup> )	1,990.5	2,720.8 (730.3)	4,027.3 (1,306.5)

### Land Availability

Here we shall consider how much new land is available for cultivation to meet the need for more agricultural acreage that the growing rural population will give rise to as well as the degree of facility with which such new land can be developed.

#### 1) Procedure for identification of new land with development potential for cultivation

Step-1: Selection of cultivable land in each block on the basis of a preliminary land evaluation, the following areas having been classified as absolutely uncultivable:

- Land with a slope of 30 deg. or more (1:50,000 map used)
- Forest reserve areas (1:50,000 map used)
- Game reserve areas (1:250,000 map used)
- Lake and dam areas
- Urban areas
- Other areas the development of which is not recommended from the standpoint of conservation of the natural environment.

Step-2: Classification of the cultivable land identified in Step-1 into eleven grades of cultivation suitability by the following procedure.

Step-3: Subtraction of the land already under cultivation from each of the above 11 categories in each block to arrive at the amount of new land with development potential for cultivation in each as indicated in the following table.

Districts	Total area	Land already under cultivation	New land with dev't potential
Hai	1,512.7 km <sup>2</sup>	602.1 km <sup>2</sup>	910.6 km <sup>2</sup>
Moshi	1,287.7 km <sup>2</sup>	541.0 km <sup>2</sup>	746.7 km <sup>2</sup>
Rombo	497.2 km <sup>2</sup>	364.7 km <sup>2</sup>	142.5 km <sup>2</sup>
Pare	5,363.4 km <sup>2</sup>	444.4 km <sup>2</sup>	4,919.0 km <sup>2</sup>
Totals	8,661.0 km <sup>2</sup>	1,942.2 km <sup>2</sup>	6,718.8 km <sup>2</sup>

#### Carrying Capacity of New Land with Development Potential for Cultivation

Let us now consider the number of smallholder households that can be accommodated by the amount of new land with development potential for cultivation determined above. The procedure is as follows.

Step-1: The number of additional smallholder households (N) can be determined by the formula:

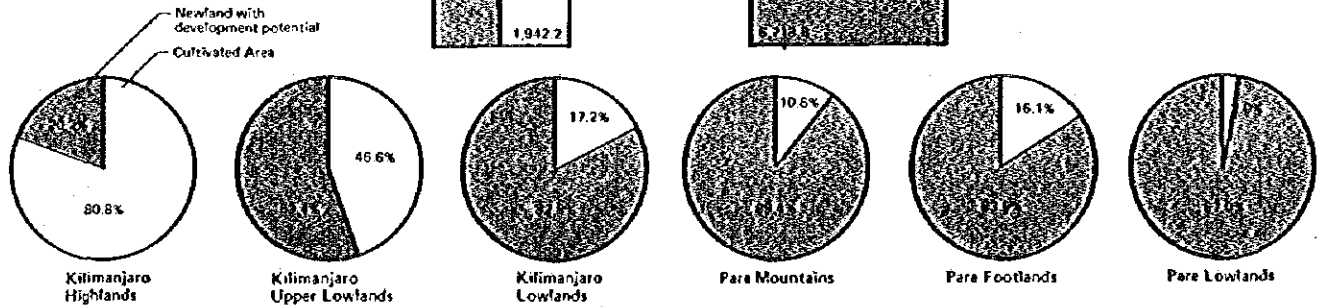
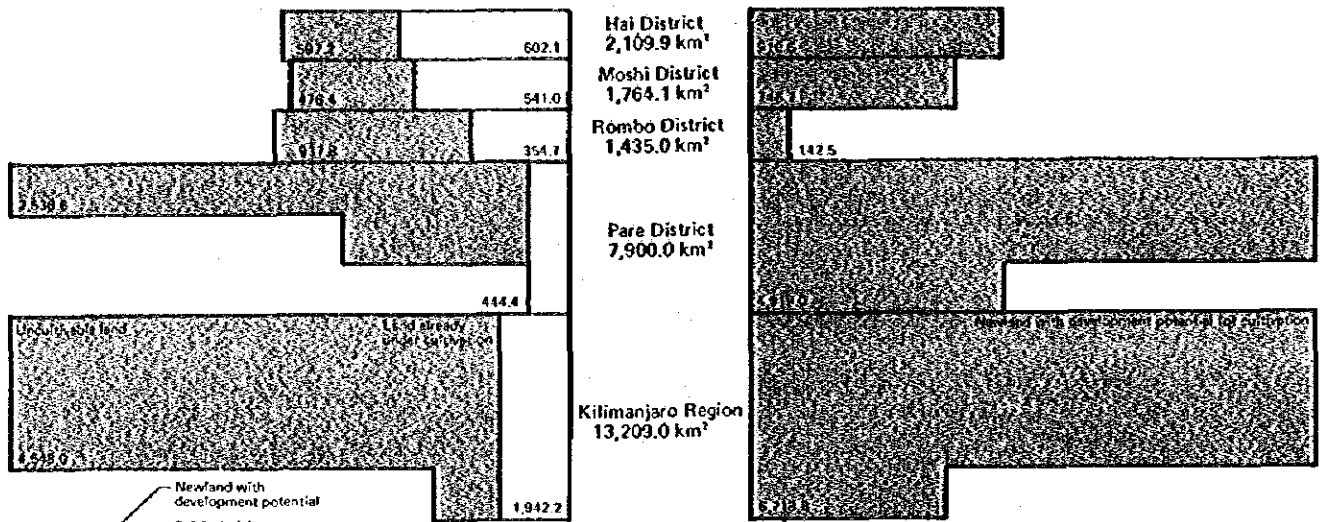
$$N = \frac{T - E}{A}$$

where T is the total amount of new land with development potential for cultivation purposes, E that amount of the total that will be used for estates, and A the average amount of land that each smallholder should cultivate.

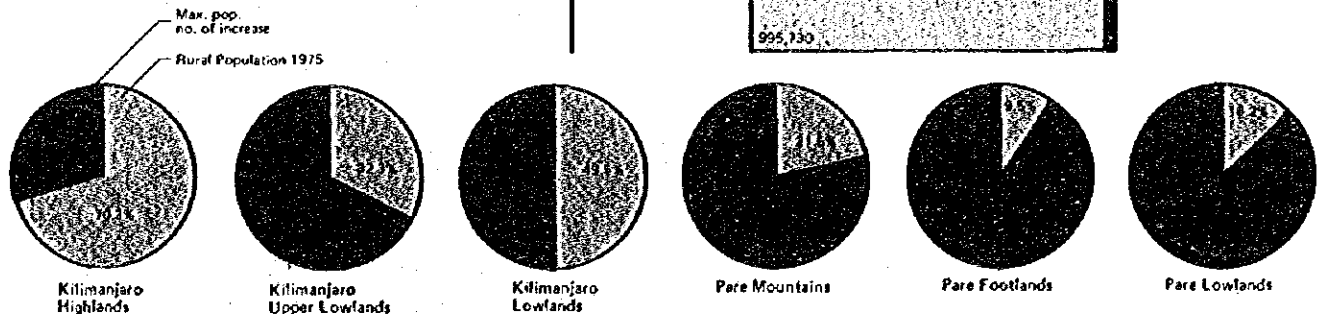
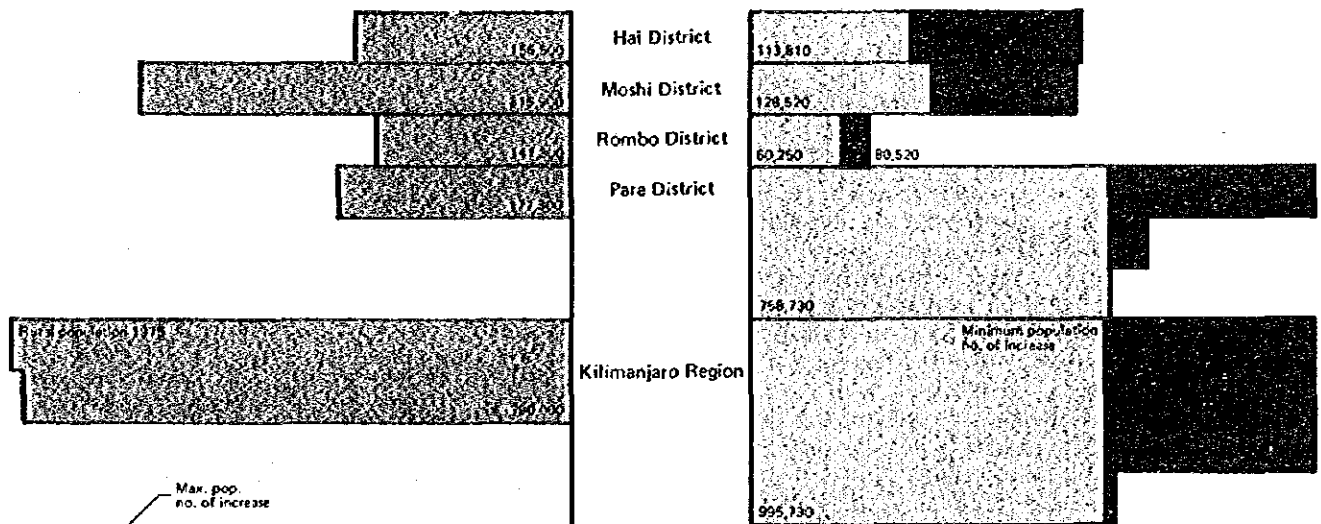
Step-2: Determination of what part of the total amount of new land with development potential for cultivation purposes should be used for estates.

Step-3: The amount of land to be cultivated by each smallholder has been set as follows for the different land classifications, primarily on the basis of natural conditions as explained in land availability.

### Newland with Development Potential for Cultivation



### Carrying Capacity of Newland with Development Potential



# LAND - USE ZONING

## Agricultural Zones

### 1) Type-1 agricultural zone

This zone consists of areas in the region with the best conditions for agricultural production and in which the agricultural infrastructure has long been well developed and the use of the land is intensive. These areas, to be found upwards of 4,000 – 4,500 ft. on the slopes of Mt. Kilimanjaro, have a total area of about 300 km<sup>2</sup>, which represents 2.3% of the regional total and 6% of all of the land in the agricultural zones. Here an effort will be made to maintain the present production environment into the future for the sake of continuing high yields and stable production and to improve the living environment, particularly in terms of social facilities. Moreover, in order to cope with increasing population, land that has not yet been developed or is presently not being used will as far as possible be put to use.

### 2) Type-2 agriculture zone

This zone consists of areas with conditions second only to those of the Type-1 agricultural zone. Accordingly, the direction of land use in them will be the same, except that the development and use standards and targets will be geared to the particular conditions pertaining. These areas, located above 4,000 ft. on the slopes of Mt. Kilimanjaro and in the north and south Pare mountains, have a total area of about 620 km<sup>2</sup>, which represent 5% of the total area of the region and 12% of all of the land in the agricultural zones. As in the case of the Type-1 agricultural zone, at the present time these areas are being cultivated entirely by smallholders, the cultivation being relatively intensive and the crops being coffee and bananas. In the future an effort will be made to bring these areas up to the level of the Type-1 areas in terms of intensity of use and level of yield through rationalization of use of irrigation, reorganization of fields, and other pertinent measures.

### 3) Type-3 agricultural zone

This zone consists of areas on the slopes of Mt. Kilimanjaro and in the Pare mountains between the altitudes of 3,500 ft. and 4,000 ft. with annual rainfall of at least 700 mm. These areas cover approximately 770 km<sup>2</sup>, which represents 6% of the total area of the region and 15% of all of the land in the agricultural zones. At present the main crops are maize and finger millet and, to a lesser extent, coffee and bananas, with some grazing here and there. Approximately 30% of this 300 km<sup>2</sup> consists of corporative estate lands in the Moshi and Hai districts. In the future the basic direction that will be taken in these areas is control of large-scale development, grazing, and other forms of extensive land use and encouragement of development by smallholders.

### 4) Type-4 agriculture zone

This zone consist of what are known as the Shamba lands, which are to be found in the upper lowland and footland zones of the region, covering an area of approximately 1,200 km<sup>2</sup>, which represents 9% of the total area of the region and 23% of all of the area of the agricultural zones. The altitude range is 3,000 – 3,500 ft., and the annual rainfall in the vicinity of 700mm, which is the bare minimum for stable agricultural production.

At the present time the land use in these areas is extensive, with crop cultivation only here and there where water and soil conditions are relatively good, the rest of the land being left fallow or used for grazing livestock. In the Hai District there is mostly wheat cultivation and dairy farming, and in the Pare District these lands consist mainly of sisal and other kinds of estates. In the future expansion of smallholder crop cultivation and of corporative estates as well as controlled grazing will be encouraged, with provision of the necessary infrastructure, and the land will have to be subdivided into many detailed land-use types for this purpose.

### 5) Type-5 agriculture zone

This zone consists of areas in which the natural conditions can support some agricultural production but not with a great deal of stability. Covering approximately 2,340 km<sup>2</sup> in the lowland and footland zones of the region, they represent 18% of the total area of the region and 45% of all of the area of the agricultural zones. At the present time only about 15% of the land in these areas is cultivated, but in the future as population increases and the demand for agricultural land grows, it will be necessary to develop them more fully, which will involve provision of agricultural infrastructure, which is almost entirely lacking. Since such development will involve chiefly large-scale irrigation development, it will have to be undertaken by corporative entities and have an intensive orientation.

## Conservation Zones

### 1) Primeval natural environment preservation area

This area coincides with the existing Kilimanjaro National Park. In it will be necessary to give complete protection to flora and wildlife as well as to make it possible to utilize them for academic and cultural purposes.

### 2) Natural environment preservation areas

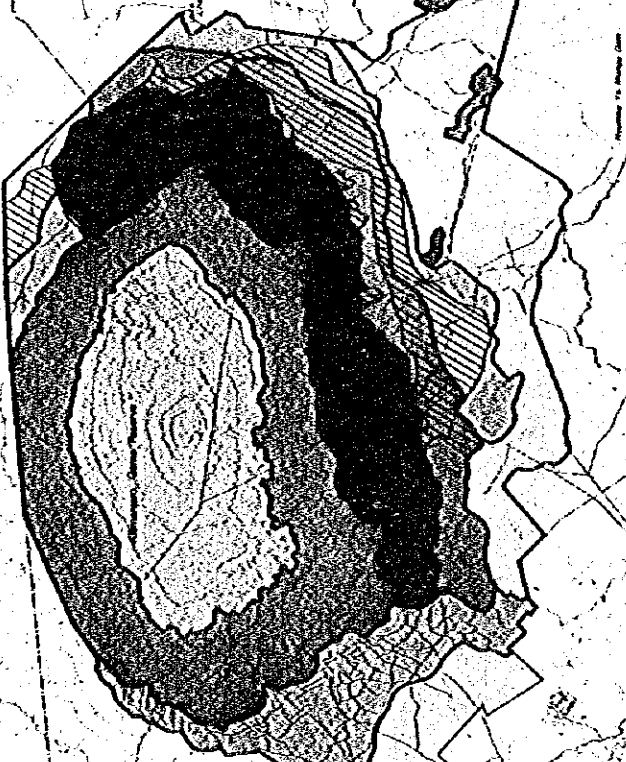
These areas coincide with the existing game reserves and forest reserves. As in the case of 1) above, there will be a basic interdict here on land development, other land uses, and even entry. In the future it will be necessary to extend these areas to about 1.5 times their present size, or 1,256.9 km<sup>2</sup>, which will represent 14.0% of the total area of the region, by altering the game reserve boundary lines and extending the limits of the forest reserves, this latter measure being also for the purpose of increasing forest production.

### 3) Development control areas

These are areas in which land development and use standards will be needed from the standpoint of conservation of the natural environment. Although these standards will vary according to the kind of conservation involved, they will basically consist of standards regarding density of use, i.e., the amount of farmland per household, density of population, field location, etc. These areas consist of the areas classified as Zone-B on the "Conservation Values" map of the natural conservation plan as well as all of the game control areas, areas with slopes in excess of 15 deg., and existing forest and thicket areas other than reserves and represent 22% of the total areas of the agricultural zones.

# USE ZONING PLAN

This plan for the zoning of the land of the region by different use types aims at eventually achieving a rational land-use pattern by gradually leading the agricultural production environment in a more healthy direction on the basis of comprehensive consideration of the natural, socioeconomic, and other relevant conditions of the region.



Area description	Land-use criteria	Main uses
<b>AGRICULTURAL ZONES</b>		
Type-1 Areas with very good natural land values	Maintain and improvement by smallholders	Coffee and banana only
Type-2 Areas with good natural land values	Intill and strengthen of infrastructure improvement and forest	Coffee and banana and some other crops
Type-3 Areas with fair natural land values	New and landscape development by government bodies	Milk, frog, coffee, banana and other crops
Type-4 Areas with poor natural land values	New and landscape development by government bodies	Milk, frog, coffee, banana and other crops
Type-5 Areas with bad natural land values	Controlled grazing and other	Controlled grazing and other
<b>CONSERVATION ZONES</b>		
Existing Kijimicho national park area	Consulate and fixation of the territory of the national park	National park
Natural environment preservation area	No settlement or other land use activities in the area	Game (forest and other nature)
Natural environment preservation area	Controlled grazing and other	Controlled grazing and other
Areas with a slope of 15% or more	Unplanned development	Same as agricultural zone
Areas with a slope of 15% or more	Unplanned development	Same as agricultural zone
Areas with the land use or control design	No control designation	No land use

# LAND-USE PLAN

## Land Development for Agriculture

### 1) Areas in which only a little improvement is needed.

These are areas in which the agricultural infrastructure is for the most part adequate and the rate of cultivation is over 50% and in which the basic direction of development is a little improvement of the present production environment and higher density and intensity of land use. They consist of the greater part of areas on the slopes of Mt. Kilimanjaro in the Type-1 and Type-2 agricultural zones and a part of the south Pare highland areas, for a total area of 700 km<sup>2</sup>, or 13.0% of the total area of the development zones.

### 2) Infill and extension zone

This zone consists of areas in which the rate of cultivation is less than 50% in spite of the fact that the agricultural infrastructure is fairly adequate or that at least it would be an easy matter to develop irrigation facilities and roads. In these areas the basic direction of development will be expansion of cultivated area with priority being given to smallholders, use of fallow land, and development of land which has not yet been used. These areas, which are located in the highland, upper lowland, mountain, and footland zones, have a total area of about 820 km<sup>2</sup>, which represents 16.0% of the total area of all development zones.

### 3) Infrastructure improvement and renewal zone

This zone consists of areas in which the agriculture infrastructure is not so good in spite of the fact that there is a fairly high rate of cultivation (50 – 70%) and high natural land values and in which the direction of development will be redevelopment of farmland chiefly through improvement of irrigation, road, and other networks. These areas are located in the lowland, mountain, and footland zones of the region and have a total area of 450 km<sup>2</sup>, which represents 9.0% of the total area of all the development zones.

### 4) New, large-scale development zone

This zone consists of areas in which there has been almost no development of farmland or of agricultural infrastructure owing to the unreliability of the natural conditions. These areas belong to the Type-1 and Type-2 agricultural zones, and their future development and use are absolutely necessary. The direction of development in them will be not development by smallholders, which is characterized by a low degree of overall supervision, but rather large-scale, organized development of large tracts of land by corporative entities. These areas, which consist of areas in the upper lowland and lowland zones and most of the footland zone, have a total area of 3,250 km<sup>2</sup>, which represents 62.0% of the total area in all of the development zones.

## Land Development for Other Purposes Than Agriculture

### 1) Livestock raising

There are four types of development of livestock raising in the region: the stall-feeding type, the small-scale subsidiary type, the dairy farming type, and the nomadic grazing type. Each type is described below.

**Stall-feeding type:** This type of development of livestock raising will apply to Mt. Kilimanjaro highland and Pare

mountain areas, where it is already in evidence. As crop cultivation become more intensive in these areas, it will be necessary to raise livestock on chemical feeds and do away with natural pastures as well as regulate overgrazing and use of steep slopes for grazing.

**Small-scale subsidiary type:** This type of livestock raising is already being practiced in upper lowland, lowland, and footland blocks in the region. In the future it will be limited to Type-4 and Type-5 agricultural lands (see 5.1) in connection with water resource and forestry development.

**Dairy farming type:** This is the government-run, large-scale, well-managed type of dairy farming presently to be found in the east part of the West Kilimanjaro block, which will be extended to the flatter west part as well, where development has been slower in spite of relatively good natural conditions.

**Nomadic grazing type:** This is the type of grazing engaged in by the Masai in areas in the region not designated for agricultural use. Since there would be hardly any advantage to further development of this type of livestock grazing, it will be left as it has been, i.e., very extensive.

### 2) Forestry

**Commercial exploitation type:** This type is presently represented by the Kahe and Rau forests. In the future all lower Moshi areas with water resource development potential, including these two existing forests, will be incorporated in this forestry category. In order to increase forestry production to 5.82 times its present level by 1995, it will be necessary to develop approximately 80.0 km<sup>2</sup> of this type of land.

**Conservation type:** The mountainside areas of north, central, and south Pare are already designated as this type of forest reserve. Besides reinforcing these areas, it will be necessary to develop the same type of forest reserves in eight other areas on the slopes of Mt. Kilimanjaro and in the Pare mountains, chiefly for the protection of river banks and slopes. Such afforestation will cover a total of 88.0 km<sup>2</sup>, or 0.83 times the present area of such forest reserves.

**Mixed exploitation and conservation type:** This type of forest is presently represented by the Kilimanjaro Forest Reserve and the Chome and Chambogo forest reserves in south Pare, for a total area of 1,130.0 km<sup>2</sup>. Besides continuing to use in the same way those parts of these forests that are presently being commercially exploited, those parts with primeval growths will have these growths improved by promoting growth through thinning.

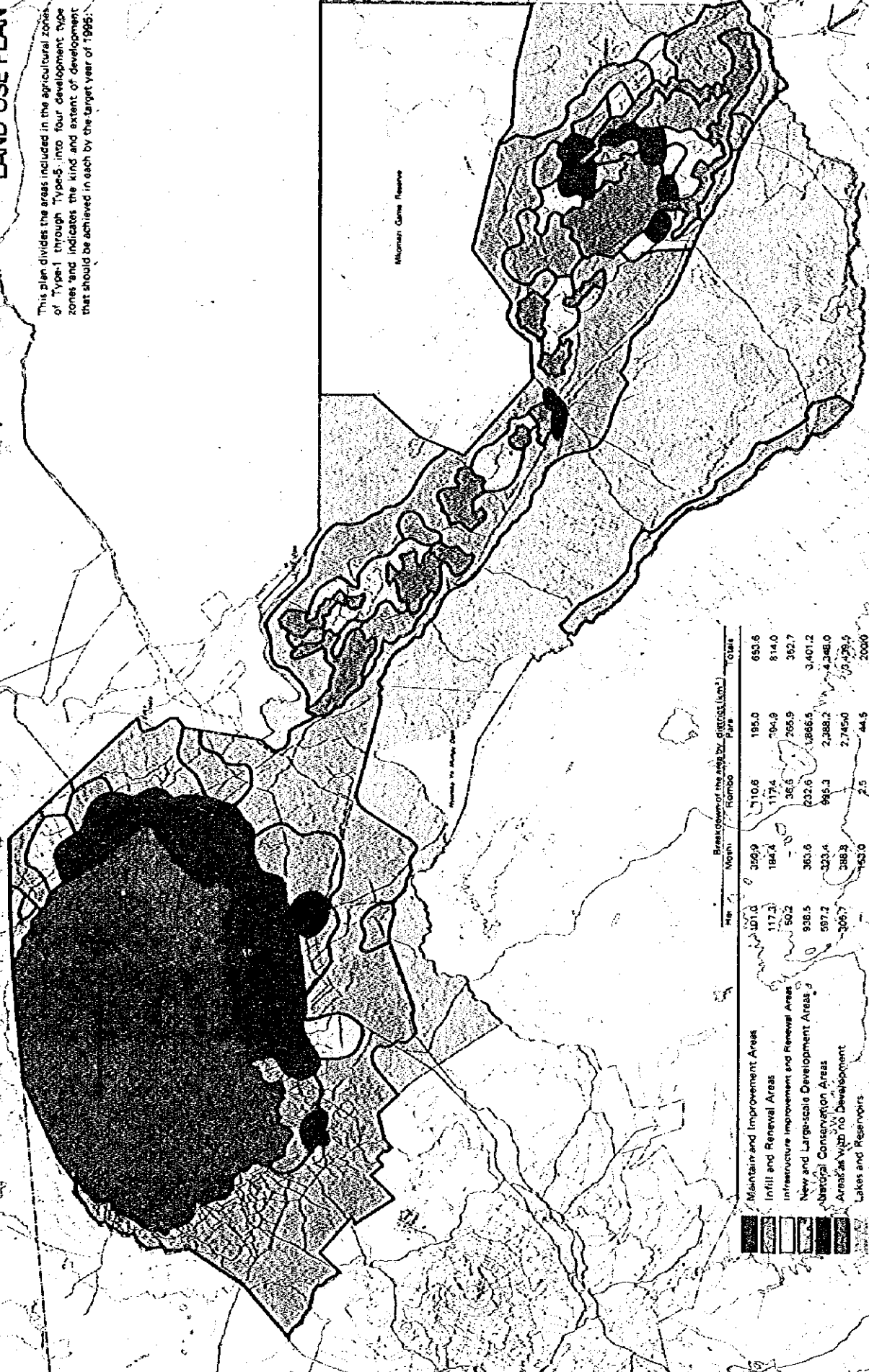
### 3) Water resource development

**Small-scale reservoirs:** Besides surveying a total of 14 locations in the Mt. Kilimanjaro highland and forest reserve blocks and north and south Pare mountain areas as possible sites for such small-scale dam reservoirs, existing irrigation intakes and channels will be repaired and extended.

**Development of underground water:** A total of seven areas — the lower Moshi alluvial plain, the lower Sanya Juu area, the Lake Chala area in the Rómbo District, and four footland areas on the west side of the Pare mountains — will be surveyed as possible locations for development of underground water to promote other development aspects which have been retarded by inadequate water resources.

# LAND-USE PLAN

This plan divides the areas included in the agricultural zones of Type-1 through Type-5 into four development type zones and indicates the kind and extent of development that should be achieved in each by the target year of 1995.



Mt. Mansfield Game Reserve

	Breakdown of the area by district (km <sup>2</sup> )			Totals
	North	Home	Paris	
Maintain and Improvement Area	101.0	110.6	195.0	650.6
Infill and Renewal Area	117.3	184.4	794.9	814.0
Infrastructure Improvement and Renewal Area	50.2	36.6	265.9	352.7
New and Large-scale Development Area	938.5	222.6	1,866.5	3,401.2
Natural Conservation Area	597.2	323.4	2,388.2	4,248.0
Areas with no Development	305.7	388.3	2,745.0	3,439.0
Lakes and Reservoirs	143.0	2.5	44.5	200.0

# POPULATION PROJECTION

## Profile of Population Growth

In the last census, which took place in 1967, the total population of the Kilimanjaro Region was placed at 653,000. Since then BRALUP has estimated the population of the region at 865,000 in 1975 on the basis of a reliable sample survey it carried out in 1973. Assuming that the rate of growth was constant, it comes to 3.58% a year during that period, at which rate the population would double in twenty years.

The natural dynamics of population are determined by the birth and death rates, the former being exceptionally high and the latter exceptionally low in the Kilimanjaro Region, which explains why its population growth rate is among the highest in the world.

The social dynamics of population are determined by the rates of population inflow and outflow, which were 2.2% and 3.9%, respectively, for the Kilimanjaro Region in 1967 according to the census of that year. These figures are for migration between regions, and no figures are available for population movement within the region. Although the region has in the past had a net population outflow, recently it is hard to say whether there is a net outflow or a net inflow because of considerable and extensive population movement in connection with the construction of Ujamaa villages.

## Problem Formulation

Living standards decline if population grows faster than the economy, as aptly pointed out by President Nyerere: "Whatever we produce has to be divided between an increasing number of people every year . . . It is no use saying that these extra 380,000 people have hands as well as mouths. For the first ten years of their life, at the very least, children eat without producing." As we have noted in the preceding section, growth of the social system must be balanced. What is meant here by balance is primarily balance between economic growth and population growth and balance between the working population and the youth population. The achievement of such balance will be no easy matter, however.

Another problem of rapid population growth is that of equity. In order to maintain the levels of social services while population is growing, it is necessary to invest a great deal of money in the construction and improvement of facilities, and all of the people, irrespective of the number of their children, must bear the burden, however, is not burden. This, however, is not really equitable in view of the fact that it is more for the benefit of those with more children than for the benefit of those with fewer children that such investment is made.

## Population Projection

What is meant here by "projection" is not simply the extrapolation of past trends. Rather, it is projection of future population on the basis of statistical methods after arriving at an appropriate population growth rate for achievement of system balance, taking into account other relevant development planning as well.

The question of what would be an appropriate population growth rate has occasioned a great deal of discussion and argument among the planners, but repeated rethinking of the question and trial calculations finally resulted in the conclusion that it should fall to 1.5 – 1.6% by 1995. This projection is an integral part of the system of goals of the whole social system.

Achieving this goal with respect to population growth will not be easy, especially if one considers the fact that ten years from now the young people who present such a large proportion of the total population will be having children themselves. In spite of all of the difficulties involved, however, this goal must be attained since it is the only way in which the Kilimanjaro Region can minimize its troubles. Moreover, considering the edge that Kilimanjaro has on other regions with respect to the level of education, this goal should be attainable, provided that both the government and the people make a serious effort to do so.

The projection has been based on W. Lexis's Cohort Method:

- 1) Determination of male and female populations for different age groups in 1975, the base year.
- 2) Estimate of death rates for different age groups
- 3) Estimate of populations of different age groups
- 4) Estimate of birth rate
- 5) Calculation of population of infants twelve months of age.

Because of the limited amount of data available, many assumptions have been made with respect to 2) and 4), including the assumption that the death rate pattern by age is the same for the region as for the whole country.

The results of projection are shown in the following. The crude birth rate should decline rapidly after 1985, by which time family planning will start having an effect.

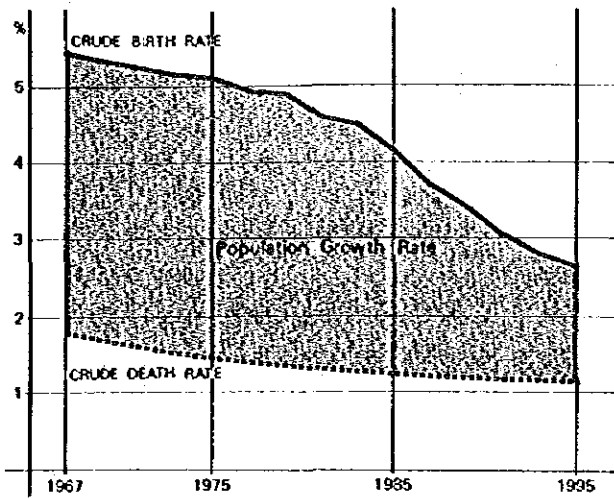
The present high proportion of the population in the 5 – 14 age group will shift to the 15 – 24 age group by 1985 and the 25 – 34 age group by 1995. Initially the proportion of the population age 14 and below will rise a little, but after 1985 it will begin to decline, falling to 46% by 1995.



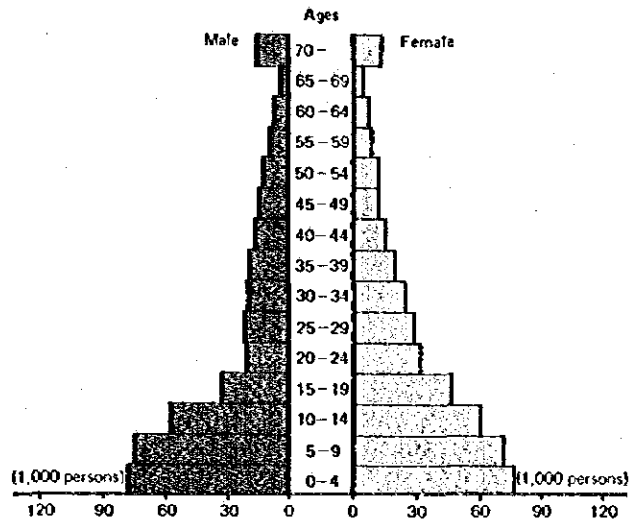
Children in Ujamaa Village



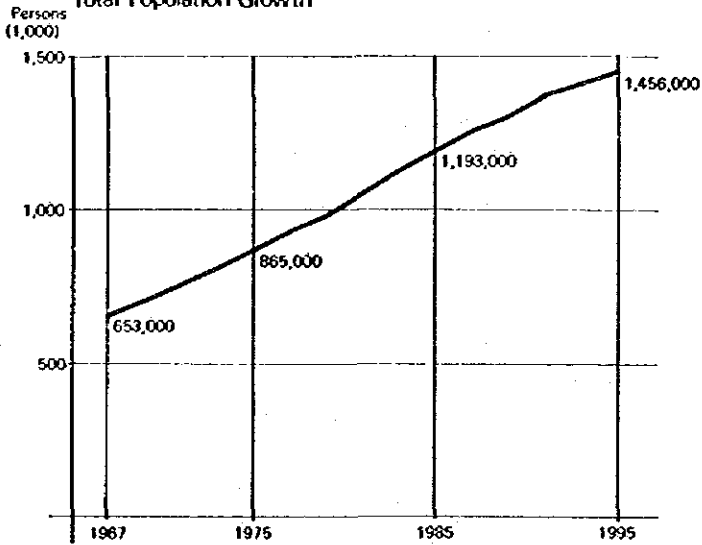
Crude Birth Rate and Crude Death Rate



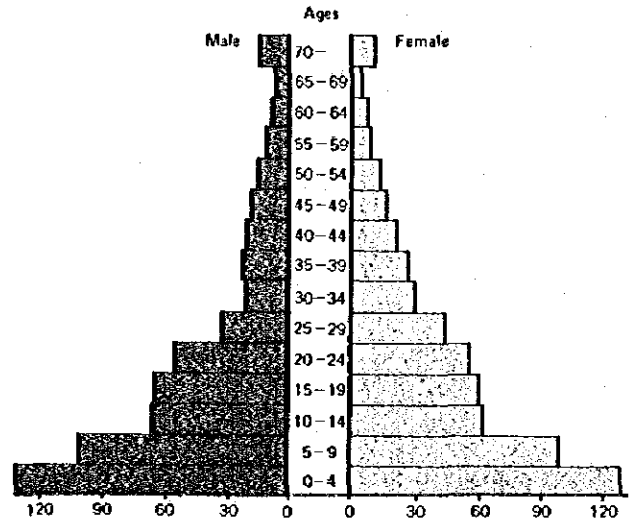
Population Pyramid 1975



Total Population Growth



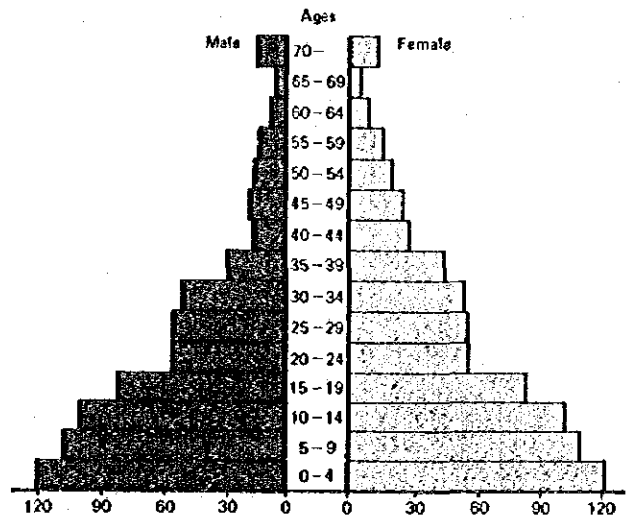
Population Pyramid 1985



Population Projection

	Total pop. (x 1,000)	Growth rate (%)		Total pop. (x 1,000)	Growth rate (%)
1967	653	3.53	82	1,090	3.32
68	676	3.52	83	1,125	3.21
69	700	3.55	84	1,159	3.02
1970	725	3.57	1985	1,193	2.93
71	751	3.59	85	1,226	2.77
72	777	3.46	87	1,257	2.53
73	805	3.60	88	1,287	2.39
74	835	3.73	89	1,315	2.18
1975	865	3.59	1990	1,342	2.05
76	894	3.35	91	1,367	1.86
77	925	3.47	92	1,390	1.68
78	956	3.35	93	1,413	1.65
79	989	3.45	94	1,455	1.56
1980	1,022	3.34	1995	1,456	1.46
81	1,055	3.23			

Population Pyramid 1995



## POPULATION DISTRIBUTION

### Ratio of Urban/Rural Population

The ratios of urban to rural population that are planned for the Kilimanjaro Region on the basis of anticipated industrial structure are given in the table below. What is meant here by urban population is people not engaged in agriculture and their families. Such persons will, as a rule, live in urban areas.

Year	Urban population	Rural population	Urban/rural ratio
1975	80,000	785,000	9:91
1980	120,000	902,000	12:88
1985	180,000	1,013,000	15:85
1990	240,000	1,102,000	18:82
1995	280,000	1,176,000	19:81

### Distribution of Urban Population

The future populations of the 4 towns and other urban areas of the Kilimanjaro Region have been set as follows on the basis of their existing populations, future functions and industrial distribution, and other considerations.

Urban areas	1975	1985	1995
Moshi Town	50,000	100,000	150,000
Same	15,000	32,500	50,000
Sanya Juu	5,000	15,000	25,000
Mkuu	5,000	15,000	25,000
Other urban areas	5,000	17,500	30,000
Totals	80,000	180,000	280,000

### Plan for Distribution of Population by Administrative Unit

Divisions	1975	1980	1985	1990	1995	Pop. increase		Pop. density (Persons/km <sup>2</sup> )	
						1975 - 95	1976	1995	
Hai District	160,544	188,700	218,200	243,700	263,600	1.64	106	125	
West Hai	97,492	119,519	141,415	160,928	175,609	1.80	71	128	
Central Hai	63,052	69,181	76,785	82,772	87,991	1.40	454	596	
Moshi District	365,895	428,500	500,700	563,500	608,500	1.66	239	345	
Central Hai	74,902	82,268	88,491	92,456	95,495	1.27	622	792	
East Hai	89,754	102,640	114,719	124,159	132,084	1.47	491	723	
Moshi Town	50,000	68,750	100,000	131,250	150,000	3.00	1,661	2,490	
TPC/Arusha Chini	4,818	5,654	6,630	7,445	8,095	1.68	8	14	
West Vonjo	58,267	67,781	77,027	84,624	90,856	1.56	156	242	
East Vonjo	88,154	101,407	113,833	123,666	131,970	1.50	393	589	
Rombo District	146,272	171,350	197,600	220,150	237,800	1.63	290	166	
Mengwe	34,970	37,997	41,813	44,724	47,265	1.35	200	270	
Mkuu	32,961	44,417	54,488	63,839	70,003	2.12	488	1,036	
Mashati	34,039	37,736	42,244	45,863	49,015	1.44	362	521	
Usseri	38,208	43,505	49,556	54,591	58,969	1.54	271	419	
Tarakia	6,094	7,695	9,499	11,133	12,548	2.06	226	465	
Pare District	192,289	233,450	276,500	314,650	346,100	1.80	24	44	
Ugweni	29,266	35,426	40,755	45,269	49,441	1.69	50	85	
Usangi	36,214	43,064	49,635	55,244	60,287	1.66	40	66	
Mwenbe/Mbanga	45,451	57,835	74,316	89,831	100,689	2.22	11	36	
Chome/Suji	18,036	21,184	24,467	27,280	29,746	1.65	10	16	
Manba/Vunta	36,588	43,860	50,458	56,079	61,221	1.67	53	88	
Gonja	26,734	32,081	36,869	40,947	44,716	1.67	26	44	
Totals or average	865,000	1,022,000	1,193,000	1,342,000	1,456,000	1.68	76	110	

### Planning Process for Distribution of Rural Population

In deciding the future population distribution of rural areas, it is necessary to take into account the natural increase in population and the amount of population that the agricultural land can support. If the population increases beyond this capacity, the surplus population will have to be absorbed elsewhere where the population does not increase to capacity.

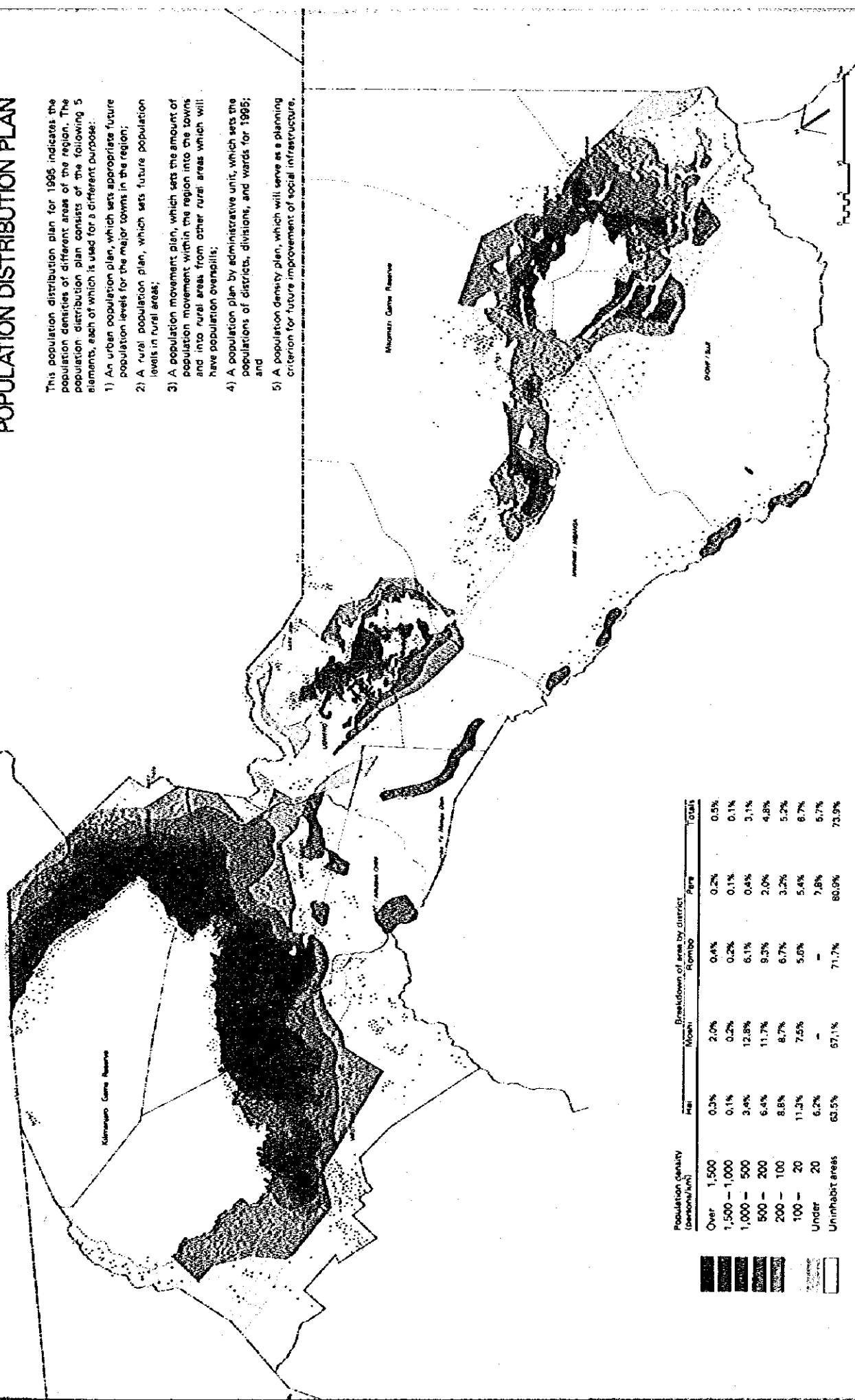
The following process has been followed in order to ascertain in each case whether the population carrying capacity of the additional land suitable for cultivation in the block will be smaller than, equal to, or greater than the natural increase in population that is foreseen.

- Step-1: Determination of the 1975 population of each of the blocks on the basis of the population statistics for 1975.
- Step-2: Determination of the 1995 population of each block on the basis of the figures for the 1975 population and the population increase coefficients for that 20-year period set in the macro-frame.
- Step-3: Determination of the amount of natural increase in population during that period.
- Step-4: Determination of the net population increases in the case of rural blocks by subtracting the amount of outflow to urban areas.
- Step-5: Determination of which blocks will have capacity to absorb additional population from rural areas of other blocks and the extent of such capacity.

# POPULATION DISTRIBUTION PLAN

This population distribution plan for 1995 indicates the population densities of different areas of the region. The population distribution plan consists of the following 5 elements, each of which is used for a different purpose:

- 1) An urban population plan, which sets appropriate future population levels for the major towns in the region;
- 2) A rural population plan, which sets future population levels in rural areas;
- 3) A population movement plan, which sets the amount of population movement within the region into the towns and into rural areas from other rural areas which will have population over spills;
- 4) A population plan by administrative unit, which sets the populations of districts, divisions, and wards for 1995; and
- 5) A population density plan, which will serve as a planning criterion for future improvement of social infrastructure.



Population density (persons/km <sup>2</sup> )	Breakdown of area by district		
	Mwanza	Rombo	Sala
Over 1,500	0.3%	2.0%	0.4%
1,500 - 1,000	0.1%	0.2%	0.1%
1,000 - 500	3.4%	12.8%	6.1%
500 - 200	6.4%	11.7%	9.2%
200 - 100	8.8%	6.7%	6.7%
100 - 20	11.3%	7.5%	5.8%
Under 20	6.2%	-	-
Uninhabited areas	63.5%	57.1%	71.7%
			80.9%
			73.9%

# POPULATION MOVEMENT

## Population Movement Planning Policy

- 1) Systematic movement of population from rural areas to urban areas is planned for on the basis of what it is considered will be appropriate town size in view of the distribution of industry, the size of the hinterland population, the kinds of urban functions that will be necessary, and other factors.
- 2) High-density rural areas will be formed by, for instance, making maximum use of the land by actively seeking out land in the highland zones which has not yet been developed, these zones already having fairly adequate social infrastructure.
- 3) The overflow population from the highland zones will be absorbed by the Mt. Kilimanjaro upper lowland zone and the Pare footland zone, in both of which there is ample leeway for systematic development.
- 4) A prerequisite for movement of population to lowland areas is agricultural development projects in which irrigation facilities are provided, such movement being geared to the development schedule.

## Social Increase of Population in Towns

The amount of inflow of population into the towns will be the difference between the populations set for them for 1995 and the respective sums of their present populations and their natural increases in population by that time. As indicated in the table below, this will mean a total flow of 123,800 persons from rural areas to the 4 towns. The figures are as follows:

Towns	Population, 1995	Population, 1975	Natural increase, 1975-95	Social increase, 1975-95
Moshi town	150,000	50,000	34,100	65,900
Same	50,000	15,000	10,300	24,700
Sanya Juu	25,000	5,000	3,400	16,600
Mkuu	25,000	5,000	3,400	16,600
Totals	250,000	75,000	51,200	123,800

## Rural Population Movement Proposal

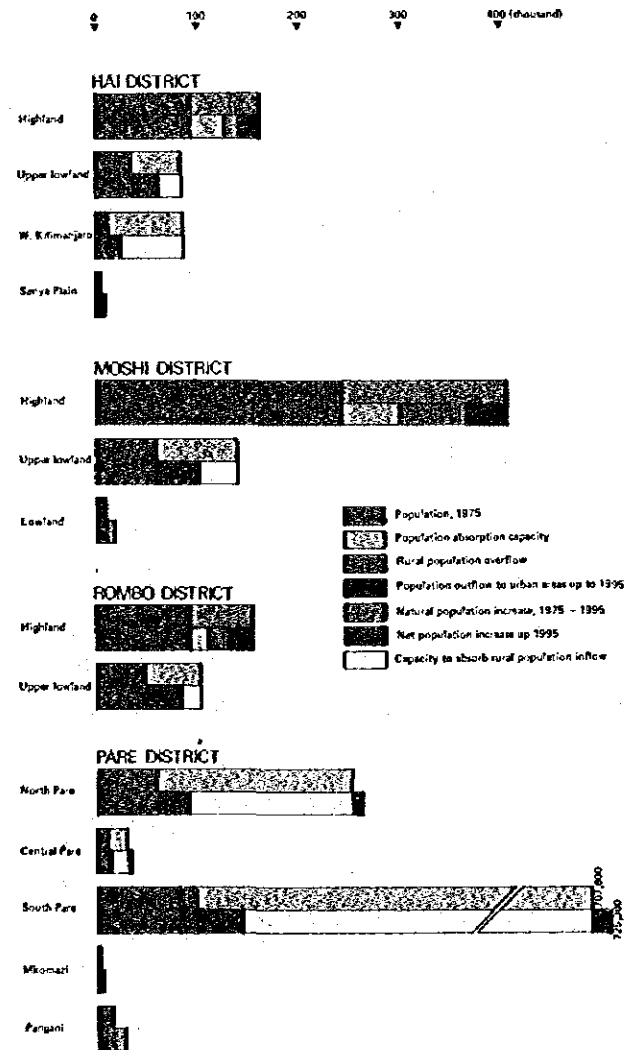
- 1) Absorption of the 15,000-person overflow from the highland block of the Hai District by the upper lowland block of the same district.
- 2) Absorption of 37,900 persons of the 65,100-person overflow from the highland block of the Moshi District by the upper lowland block of the same district.
- 3) Absorption of the remaining 27,200 persons of the Moshi highland block overflow by the Pare District, including the Pangani Basin through its agricultural development (and perhaps in part by the Hai lowland block through its development and/or the West Kilimanjaro block of the Hai District).
- 4) Absorption of 20,100 persons of the 21,900-person population overflow from the highland block of the Rombo District by the Rombo upper lowland block.

- 5) Absorption of the remaining 1,800 persons of the Rombo highland block overflow in the same manner as the overflow from the Moshi highland block.
- 6) Absorption by the Pare District blocks, which will have plenty of population carrying capacity in excess of their natural population increases, of the overflows from the other districts of the region.

## Schedule of Population Movement Between Districts

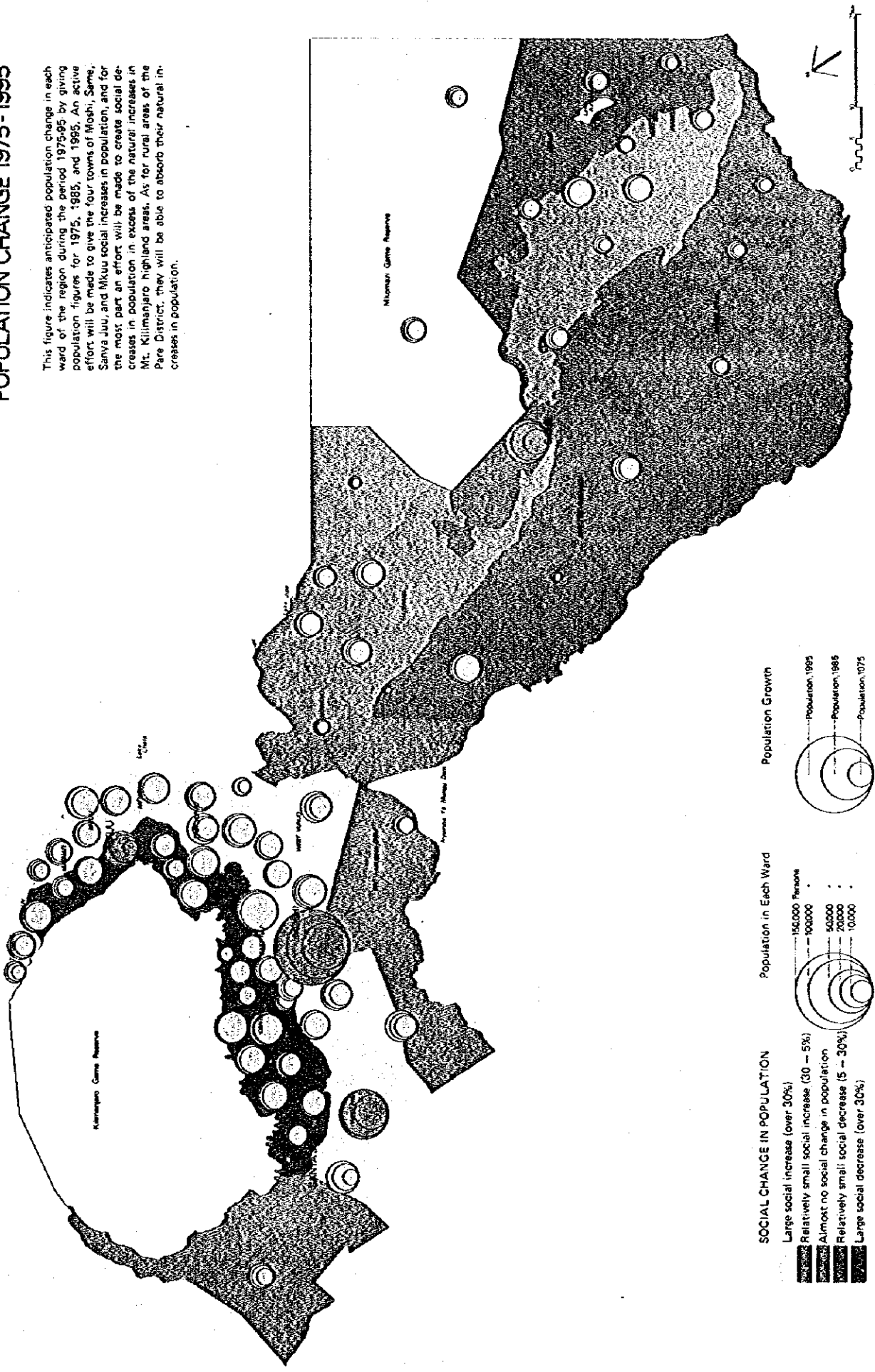
Districts	1976-80	1981-85	1986-90	1991-95
<b>Hai District</b>				
To Moshi District	1,000	2,200	2,200	1,200
<b>Moshi District</b>				
To Pare District	6,800	6,800	6,800	6,800
From other districts	3,000	6,600	6,600	3,600
<b>Rambo District</b>				
To Moshi District	1,000	2,200	2,200	1,200
To Pare District	450	450	450	450
<b>Pare District</b>				
To Moshi District	1,000	2,200	2,200	1,200
From other districts	7,250	7,250	7,250	7,250

## Breakdown of Population by Block



# POPULATION CHANGE 1975 - 1995

This figure indicates anticipated population change in each ward of the region during the period 1975-95 by giving population figures for 1975, 1985, and 1995. An active effort will be made to give the four towns of Moshi, Same, Sanva Juu, and Mkuu social increases in population, and for the most part an effort will be made to create social decreases in population in excess of the natural increases in Mt. Kilimanjaro highland areas. As for rural areas of the Pare District, they will be able to absorb their natural increases in population.



# COMMUNITY DEVELOPMENT PROGRAM

## Purpose of the Program

The purpose of the community development program is to serve as a guideline for the formation of orderly, dynamic, and viable communities on different levels on the basis of a long-range perspective of the socioeconomic development of the region. This will involve, among other things, the following:

- 1) Having urban and rural areas complement each other closely in terms of function;
- 2) Identification and establishment of the functions of each community level;
- 3) Systematic linkage between different levels in the community hierarchy; and
- 4) Vital interaction between communities on the same level.

## Community Hierarchy

The community hierarchy of the Kilimanjaro Region will be established as follows. The purpose of establishing such a community hierarchy is to plan for improvement of the quality of life at each community level, including greater provision of social and public services in both quantitative and qualitative terms, and to further the interaction of inhabitants of different parts of the region.

- 1) The village-level community (population 3,500), with a radius of about 2 km and in which most of the activities of daily life take place.
- 2) The ward-level community (population 20,000), with a radius of 3 – 5 km.
- 3) The division-level community (population 80,000), with a radius of 4 – 13 km.
- 4) The district-level community.
- 5) The regional-level community.

## Number of Communities

In setting the boundaries of the communities on each level, administrative boundaries have served as a basis, but consideration has also been given to compactness and optimum extent.

Although there are only 4 districts in the region, 5 communities have been set on the district level, 2 of them in the Pare District. The North Pare community consists of the Ugweno and Usangi divisions and the South Pare community of the Same, Mwembe, Chome/Suji, Mamba/Vunta, and Gonja divisions. The reason why the Pare District has been divided into two district-level communities is that the two are not contiguous and are also distinct from one another in terms of population distribution and terrain.

There are 19 division-level communities, consisting of the areas around the four towns of Moshi, Same, Sanya Juu, and Mkuu and the 15 division centers. The difference between this classification and the administrative classification is that the West Hai Division has been divided into two

communities because of its extensive size and the Tarakea Division in the Rombo District has been incorporated in the same community as the Usseri Division because it is too small to constitute a community on this level on its own.

The ward-level and village-level communities coincide completely with their administrative counterparts.

The numbers of the communities on each level are in the table below.

Community levels	Hai	Moshi	Rombo	North Pare	South Pare
District	1	1	1	1	1
Division	3	5	4	2	5
Ward	11	29	11	8	17
Village	80	143	56	49	73

## Planned Community Structure

District-level communities	Division-level communities	Division centers	Population, 1995
Hai	West Hai	Sanya Juu*	106,800
	Masama	Masama	68,800
	Central Hai	Machame	88,000
			263,600
Moshi	Central Hai	Kibosho	95,500
	East Hai	Uru	132,100
	Moshi Town	Moshi Town*	158,000
	West Vunjo	Kirua	90,900
	East Vunjo	Marangu	132,000
			608,500
Rombo	Mengwe	Mengwe	47,300
	Mkuu	Mkuu*	70,000
	Mashati	Mashati	49,000
	Usseri	Usseri	71,500
			237,800
North Pare	Ugweno	Ugweno	49,400
	Usangi	Usangi	60,300
			109,700
South Pare	Same	Same*	50,000
	Mwembe	Mwembe	50,700
	Chome/Suji	Makanya	29,800
	Mamba/Vunta	Ndungu	61,200
	Gonja	Gonja	44,700
			236,400

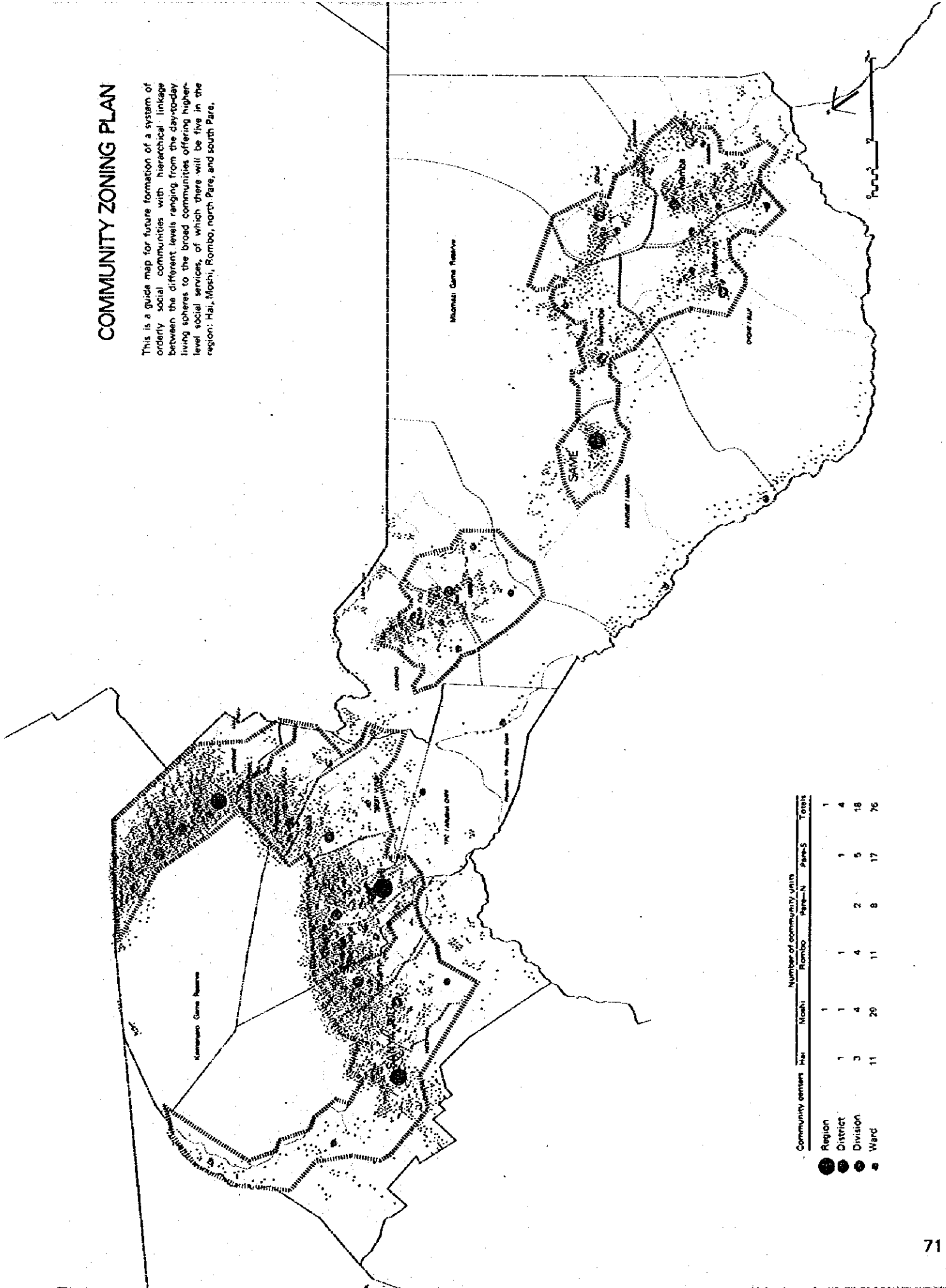
\* Also serves as district center.



Open-Air Market Near Moshi Town (c. 1970)

# COMMUNITY ZONING PLAN

This is a guide map for future formation of a system of orderly social communities with hierarchical linkage between the different levels ranging from the day-to-day living spheres to the broad communities offering higher level social services, of which there will be five in the region: Hai, Moshi, Rombo, north Pare, and south Pare.



	Community centers					Number of community units		
	Hai	Moshi	Rombo	Pare-N	Pare-S	Totals		
Region		1	1			1		
District	1	1	1	1	1	4		
Division	3	4	4	2	5	18		
Ward	11	20	11	8	17	76		

# SOCIAL INFRASTRUCTURE DIAGNOSIS

## Purpose of the Study

The area of the region must be classified into different categories for social infrastructure purposes on the basis of the land-use plan and the population distribution plan in order to make it possible to ensure a standard of living in the region that is adequate culturally and in terms of health as well as an adequate degree of functionalness of regional activities, and each category of area must be provided the kinds of public facilities that it needs.

This diagnosis, which also takes into account population distribution, makes it possible to identify problems and consider how they should be dealt with.

## Evaluation Method

Diagnosis of the state of social infrastructure in the Kilimanjaro Region has been based on the following criteria.

### Primary:

- A) Good road accessibility – within 1 km of trunk road or 500 m of feeder road
- B) Water supply areas – city water supply areas and areas within 500 m of domestic water pipeline
- C) Medical care service areas – within a radius of 4 km of hospital or health center and villages with dispensary
- D) Education service areas – villages with primary school

### Secondary:

- E) Commercial service areas – within a radius of 4 km of open-air market or other commercial facility
- F) Electricity supply areas – covered areas
- G) Telephone service areas – covered areas
- H) Postal service areas – within a radius of 4 km of post office
- J) Bus service areas – within 2 km of a bus route

The areas have been ranked as follows according to which of the above criteria are satisfied in them.

Ranking	Primary criteria				Secondary criteria					
	A	B	C	D	E	F	G	H	J	
Very good	A	B	C	D	E	F	G	H	J	
Good	A	B	C	D	Any 2–4					
Fair	A	B	C/D							
Poor	A	B/C/D			Not relevant to evaluation					
Bad	None									

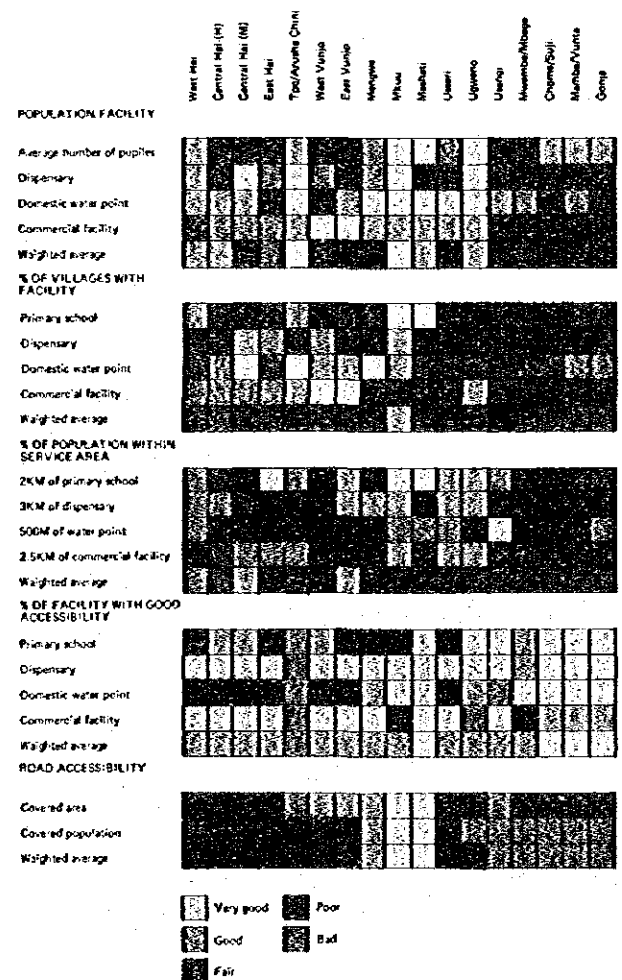
## Results of Diagnosis

The table below gives a percentage breakdown of the area of each district according to the above ranking, a map on a scale of 1:250,000 having been used for the analysis. As one can see, 30% of the land in the region with human settlement, i.e., areas other than regulated areas such as national park, game reserve, and forest reserve areas, has been ranked as "fair" or better. The order of the districts in terms of the percentage of land with at least this rank is Rombo (56%), Hai (38%), Moshi (37%), and Pare (22%).

Urban areas are for the most part rated as "very good," and Mt. Kilimanjaro highland areas as at least "good." In north Pare about half of the highland area is rated good, but in south Pare footland areas are on the whole rated better than highland areas. Worthy of notice is the fact that a full 51% of the area of the region is rated as "bad."

Ranking	Hai	Moshi	Rombo	Pare	Whole region
Very good	3%	6%	5%	1%	2%
Good	16%	11%	25%	9%	12%
Fair	19%	20%	26%	12%	16%
Poor	28%	28%	30%	12%	19%
Bad	34%	35%	14%	66%	51%

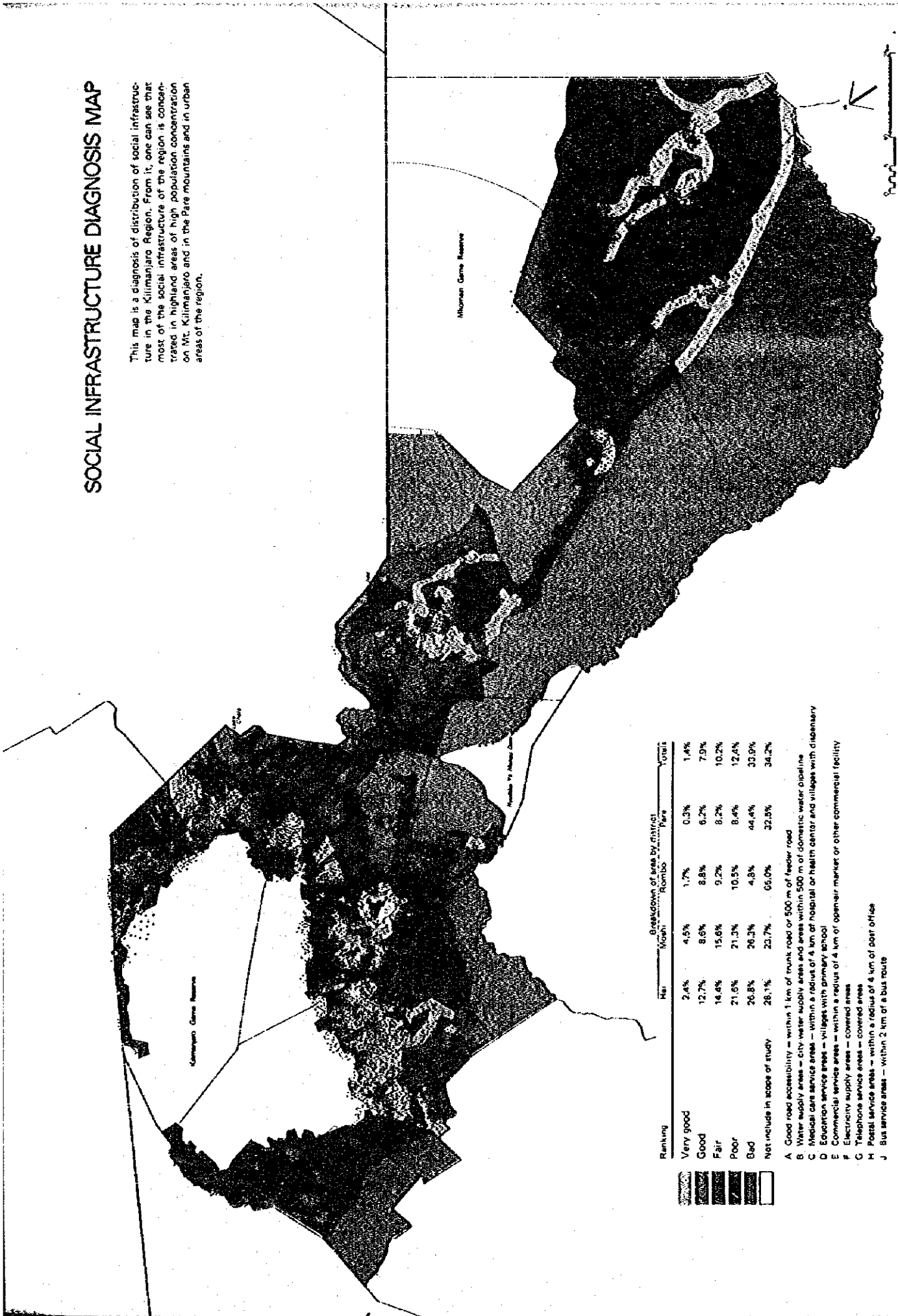
## Social Infrastructure Adequacy Evaluation by District





# SOCIAL INFRASTRUCTURE DIAGNOSIS MAP

This map is a diagnosis of distribution of social infrastructure in the Kilimanjaro Region. From it, one can see that most of the social infrastructure of the region is concentrated in highland areas of high population concentration on Mt. Kilimanjaro and in the Pare mountains and in urban areas of the region.



Ranking	Breakdown of area by district				
	Hai	Moshi	Rombo	Para	Yanga
Very good	2.4%	4.5%	1.7%	0.3%	1.4%
Good	12.7%	8.6%	8.8%	6.2%	7.9%
Fair	14.4%	15.6%	9.2%	8.2%	10.2%
Poor	21.5%	21.3%	10.5%	8.4%	12.4%
Bad	26.8%	26.3%	4.8%	44.4%	33.9%
Not include in scope of study	26.1%	23.7%	65.0%	32.8%	34.2%

- A. Good road accessibility — within 1 km of trunk road or 500 m of feeder road
- B. Water supply areas — city-water supply areas and areas within 500 m of domestic water pipeline
- C. Medical care service areas — within a radius of 4 km of hospital or health center and villages with dispensary
- D. Education service areas — villages with primary school
- E. Commercial service areas — within a radius of 4 km of open-air market or other commercial facility
- F. Electricity supply areas — covered areas
- G. Telephone service areas — covered areas
- H. Postal service areas — within a radius of 4 km of post office
- J. Bus service areas — within 2 km of a bus route

# HUMAN SETTLEMENT PROGRAM

## Inventory of Human Settlement

The features and problems with respect to social infrastructure can be more concretely identified by comparing the present state of provision of such infrastructure and the distribution of population in 1975.

The matrix below indicates categories of social infrastructure adequacy as combinations of the above ranks of social infrastructure provision and different population densities.

Population density (persons/km <sup>2</sup> )	Social infrastructure evaluation				
	Very good	Good	Fair	Poor	Bad
Over 1,500	1	2	2	x	x
1,500 - 1,000	1	3	3	6	x
1,000 - 500	1	3	3	6	6
500 - 200	1	4	4	6	6
200 - 100	x	5	5	*	*
100 - 20	x	x	7	7	7
Under 20	x	x	x	8	8

\* Areas with a "poor" or "bad" rating with respect to overall quantity of social infrastructure and a population density of 100 - 200 persons/km<sup>2</sup> will be considered either as Category-6 areas or as Category-7 areas, depending on whether it is considered most advisable to promote villagization or to supply more social infrastructure urgently, the decisive factor being the extent to which what little population there is to be found in relatively high localized densities.

## Percentages of the Total Area of Each District in Each Category of Social Infrastructure Adequacy

Approximately 13% of the total area of the region is included in Categories 1 - 5 as areas in which the overall quantity of social infrastructure is at least "fair" and the population density is at least 100 persons/km<sup>2</sup>. The order of the districts according to the percentage of their total areas included in these categories is: Moshi (25.0%), Rombo (16.4%), Hai (15.4%), and Pare (5.7%).

Categories	Hai	Moshi	Rombo	Pare	Whole region
Category-1	2.4%	4.0%	1.6%	0.2%	1.2%
Category-2	0	0.2%	0	0	2.1%
Category-3	2.6%	9.7%	5.9%	0.9%	2.9%
Category-4	6.8%	4.7%	3.6%	2.5%	3.6%
Category-5	3.6%	6.4%	5.3%	2.1%	3.2%
Category-6	4.2%	15.1%	2.4%	1.1%	3.6%
Category-7	22.5%	23.0%	14.2%	15.5%	17.5%
Category-8	10.0%	2.3%	1.8%	18.5%	13.2%

## Problem Areas

Areas in Category-6, which have a "poor" or "bad" social infrastructure rating and a population density of at least 100 persons/km<sup>2</sup>, represent 3.6% of the total area of the region and are located particularly along the boundary of the Mt. Kilimanjaro forest reserve and in the upper lowland zone.

Areas in Category-7, which have a "fair," "poor," or "bad" social infrastructure rating and a low population density of 20 - 200 persons/km<sup>2</sup>, represent 17.5% of the total area of the region and are located particularly along the boundary

between the upper lowland and lowland zones and in the footland zone.

Areas in Category-8, which have only very scattered settlement and hence a population density of under 20 persons/km<sup>2</sup>, represent 13.2% of the total area of the region and are located particularly in the footland zone.

## Recommendations

The following measures are proposed for each category for future improvement of social infrastructure adequacy:

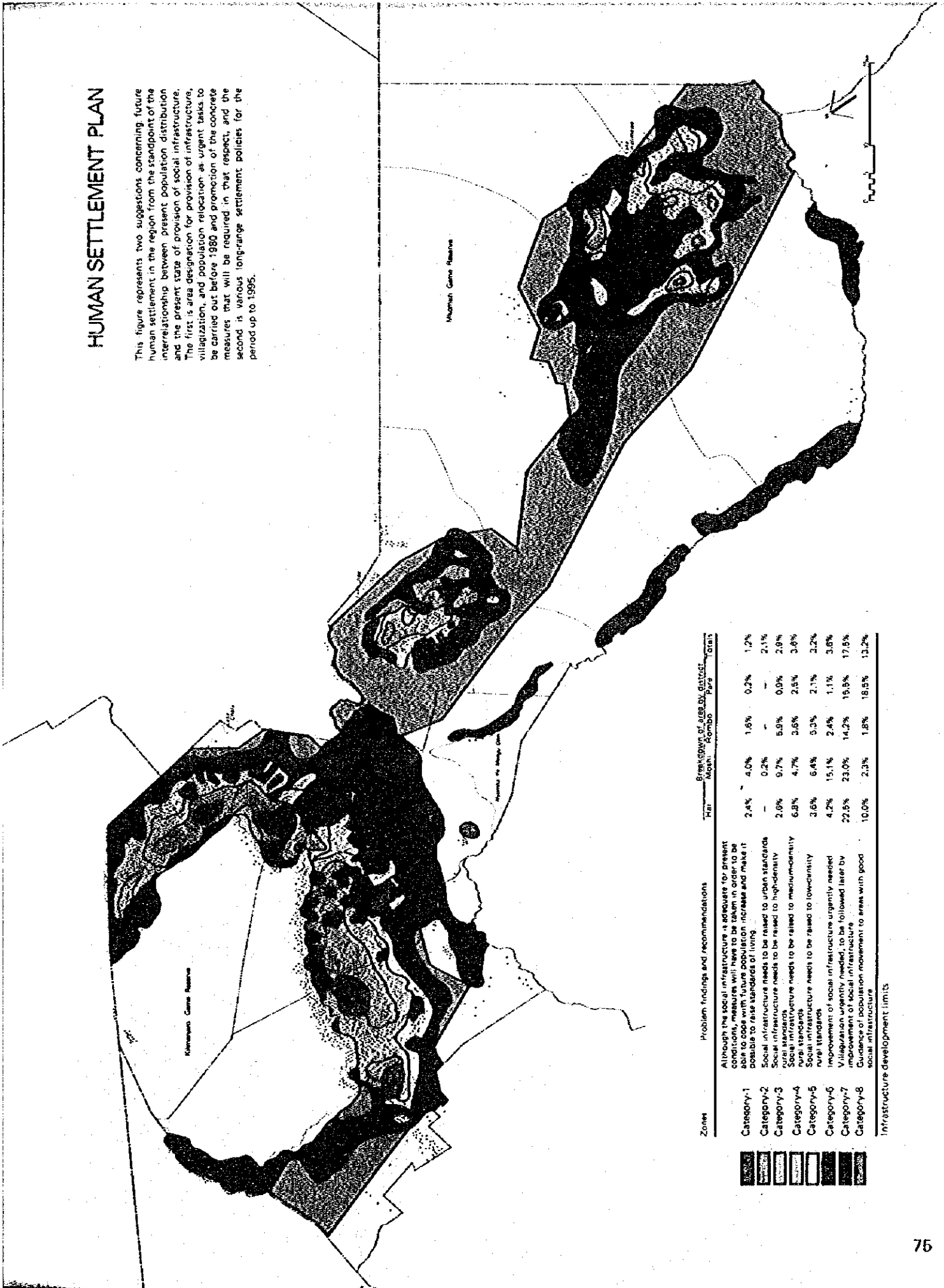
- Category 1: Although the social infrastructure is adequate for present conditions, measures will have to be taken in order to be able to cope with future population increase and make it possible to raise standards of living
- Category-2: Social infrastructure needs to be raised to urban standards
- Category-3: Social infrastructure needs to be raised to high-density rural standards
- Category-4: Social infrastructure needs to be raised to medium-density rural standards
- Category-5: Social infrastructure needs to be raised to low-density rural standards
- Category-6: Improvement of social infrastructure urgently needed
- Category-7: Villagization urgently needed, to be followed later by improvement of social infrastructure
- Category-8: Movement of population to areas with good social infrastructure



Piped Water Supply

# HUMAN SETTLEMENT PLAN

This figure represents two suggestions concerning future human settlement in the region from the standpoint of the interrelationship between present population distribution and the present state of provision of social infrastructure. The first is area designation for provision of infrastructure, villagization, and population relocation as urgent tasks to be carried out before 1980 and promotion of the concrete measures that will be required in that respect, and the second is various long-range settlement policies for the period up to 1995.



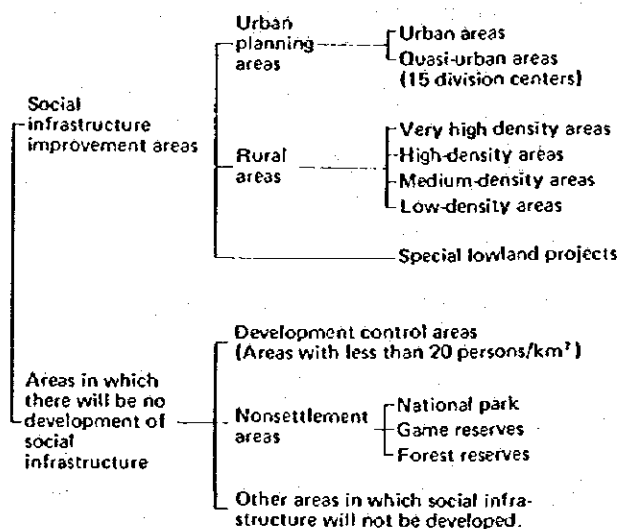
Zones	Problem findings and recommendations	Breakdown of area by district				
		Hill	Moah	Rombu	Para	Gish
Category-1	Although the social infrastructure is adequate for present conditions, measures will have to be taken in order to be able to cope with future population increase and make it possible to raise standards of living.	2.4%	4.0%	1.6%	0.2%	1.2%
Category-2	Social infrastructure needs to be raised to urban standards	—	0.2%	—	—	2.1%
Category-3	Social infrastructure needs to be raised to high-density rural standards	2.6%	9.7%	5.9%	0.9%	2.9%
Category-4	Social infrastructure needs to be raised to medium-density rural standards	6.8%	4.7%	3.6%	2.5%	3.6%
Category-5	Social infrastructure needs to be raised to low-density rural standards	3.6%	6.4%	5.3%	2.1%	3.2%
Category-6	Improvement of social infrastructure urgently needed	4.2%	15.1%	2.4%	1.1%	3.6%
Category-7	Villagization urgently needed, to be followed later by improvement of social infrastructure	22.5%	23.0%	14.2%	19.5%	17.5%
Category-8	Guidance of population movement to areas with good social infrastructure	10.0%	2.3%	1.8%	18.5%	13.2%

Infrastructure development limits

# SOCIAL INFRASTRUCTURE ZONING

## General

The area of the region has been divided into the following categories for long-term development of social infrastructure on the basis of the land-use plan, the population distribution plan and the population density plan among other considerations.



## Area Classification

Social infrastructure will be developed to some extent or other in the zone, indicated below, which is comprised of the entirety of the highland, upper lowland, mountain, and footland zones of the Kilimanjaro Region, a small part of the lowland zone, and the 3 km-wide strips of land on both sides of trunk and regional roads in other areas, this zone constituting 26% of the total area of the region.

This zone is further broken down into the following 7 area classifications.

### 1) Urban areas

This classification consists of the main towns of each district, i.e., Moshi, Same, Sanya Juu, and Mkuu, the population density in each case being over 3,500 persons/km<sup>2</sup>.

### 2) Quasi-urban areas

These are the 15 division centers listed below, the average area of which will be 1 km<sup>2</sup> and the density of which will be over 2,000 persons/km<sup>2</sup>:

Hai	Moshi	Rombo	Pare
Masama	Kibosho	Mengwe	Ugweno
Machame	Uru	Mashati	Usangi
	Kirua	Usseri	Mwembe
	Marangu		Makanya
			Gonja

### 3) Very high density rural areas

These are highland areas on Mt. Kilimanjaro which are expected to have population densities in excess of 1,000 persons/km<sup>2</sup> in the future.

### 4) High-density rural areas

These are highland areas in both the Mt. Kilimanjaro area and the Pare District which are expected to have population densities in the range 500 – 1,000 persons/km<sup>2</sup>.

### 5) Medium-density rural areas

These are upper lowland and Pare highland areas that are expected to have population densities in the range 200 – 500 persons/km<sup>2</sup>.

### 6) Low-density rural areas

These are upper lowland and Pare footland areas that are expected to have population densities in the range 100 – 200 persons/km<sup>2</sup>.

### 7) Development control areas

These are areas with only scattered settlement and population densities of under 100 persons/km<sup>2</sup> in which there will be no infrastructural development before 1955.

## Framework for Development of Social Infrastructure

The following table gives the areas and populations for each of these area classifications in 1975 and 1995 as well as for 3 other classifications. The first 6 classifications, the areas of which will be provided more social infrastructure, account for 20.4% of the region's total area and 93.8% of its population.

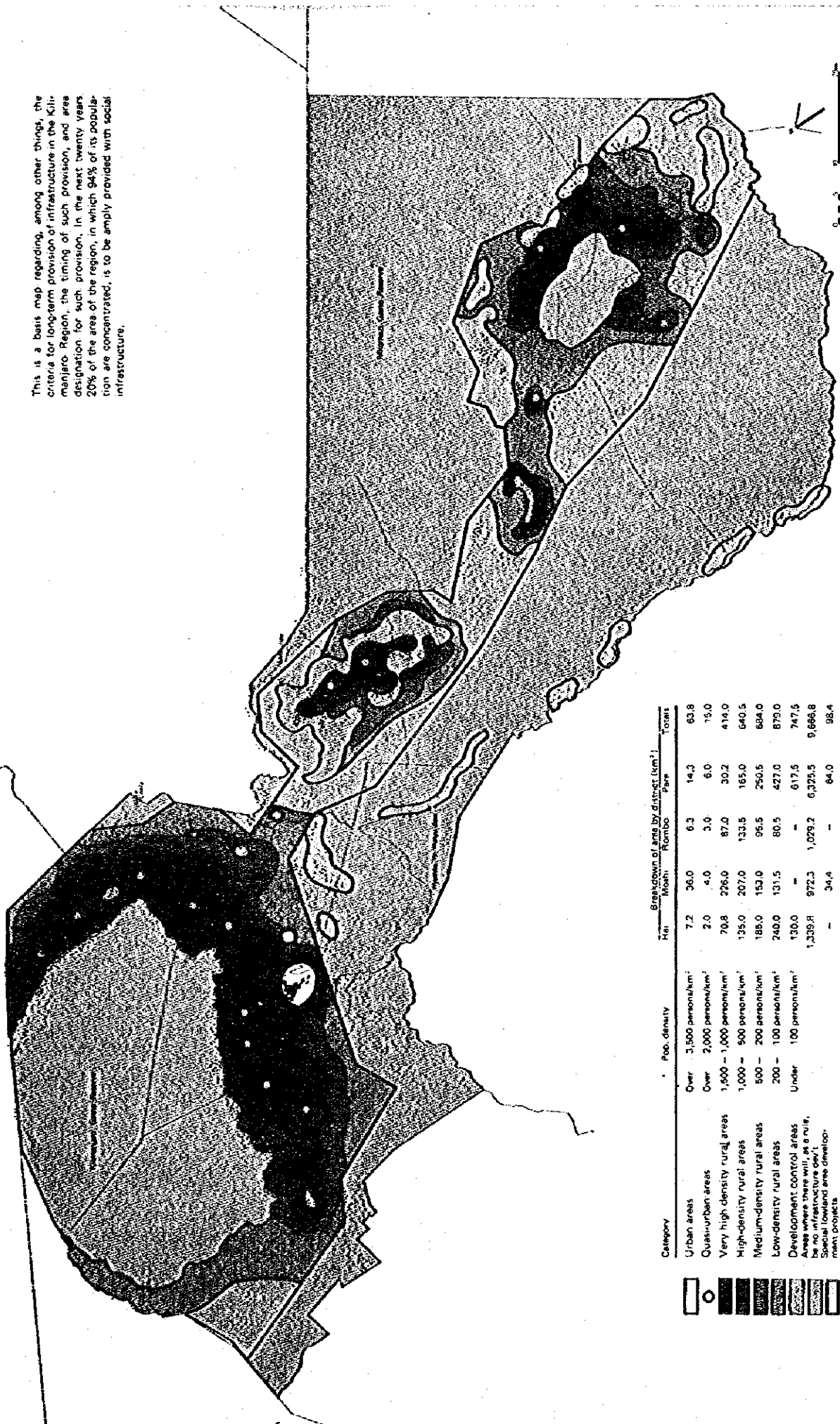
Zones	Area (km <sup>2</sup> )		Population	
	1975	1995	1975	1995
Urban areas	41.9 (0.3%)	63.8 (0.5%)	75,000 (8.7%)	250,000 (17.2%)
Quasi-urban areas	2.6 (-)	15.0 (0.1%)	5,000 (0.6%)	30,000 (2.1%)
Very high density rural areas	142.5 (1.1%)	414.0 (3.1%)	162,800 (18.8%)	419,000 (28.8%)
High-density rural areas	394.5 (3.0%)	640.5 (4.8%)	269,100 (31.1%)	388,000 (26.6%)
Medium-density rural areas	590.0 (4.5%)	684.0 (5.2%)	184,800 (21.4%)	180,000 (12.4%)
Low-density rural areas	716.5 (5.4%)	879.0 (6.7%)	97,500 (11.2%)	98,000 (6.7%)
Development control areas	-	747.5 (5.7%)	-	13,000 (0.9%)
Very low-density rural areas	4,928.7 (37.3%)	-	70,800 (8.2%)	-
Special lowland projects	-	107.0 (0.8%)	-	78,000 (5.3%)
Other areas	6,392.3 (48.4%)	9,658.2 (73.1%)	0	0
<b>Totals</b>	<b>13,209.0</b>	<b>13,209.0</b>	<b>865,000</b>	<b>1,456,000</b>



Construction of Storm Sewer in Moshi Town

# SOCIAL INFRASTRUCTURE ZONING PLAN

This is a basis map regarding, among other things, the criteria for long-term provision of infrastructure in the Kilimanjaro Region, the timing of such provision, and area designation for such provision. In the next twenty years 20% of the area of the region, in which 94% of its population are concentrated, is to be amply provided with social infrastructure.



Breakdown of area by district (km<sup>2</sup>)

Category	Pop. density	Pop.	Mean Pop./km <sup>2</sup>	Rural/Pop.	Urban/Pop.	Totals
Urban areas	Over 3,500 persons/km <sup>2</sup>	7.2	36.0	6.3	14.3	63.8
Quasi-urban areas	Over 2,000 persons/km <sup>2</sup>	2.0	4.0	3.0	6.0	16.0
Very high density rural areas	1,500 - 1,000 persons/km <sup>2</sup>	70.8	226.0	87.0	30.2	414.0
High-density rural areas	1,000 - 500 persons/km <sup>2</sup>	135.0	207.0	133.5	165.0	640.5
Medium-density rural areas	500 - 200 persons/km <sup>2</sup>	185.0	153.0	96.5	250.5	604.0
Low-density rural areas	200 - 100 persons/km <sup>2</sup>	240.0	131.5	80.5	427.0	873.0
Development control areas	Under 100 persons/km <sup>2</sup>	130.0	-	-	617.5	747.5
Areas where there will, at a minimum, be no infrastructure over 100 years		1,339.8	872.3	1,029.2	6,325.5	9,665.8
Special lowland area development projects		-	34.4	-	84.0	98.4

# SOCIAL INFRASTRUCTURE DEVELOPMENT PROGRAM

## Social Infrastructure Development Targets by Phase

The table below gives the development targets for each phase for each item of social infrastructure in terms of various percentages as explained in the remarks.

Items	Present	By 1980	By 1985	By 1995
Primary schools	94%	100%	100%	100%
Dispensaries	27%	42%	66%	100%
Multi-purpose stores	50%	70%	83%	100%
Bus service	92%	94%	96%	100%
Telephone service	4.2%	4.7%		15%
Water supply	39.4%	66.7%	83.4%	100%
Electricity supply	1.9%	2.8%	6.5%	15.9%
Sanitary sewerage	20%	35%	50%	90%

Remarks: % of villages with primary school  
 % of villages with dispensary  
 % of villages with multi-purpose store  
 % of population serviced by bus transportation, i.e., living within 5km (1975), 4km (1980), 3km (1985), 2km (1990) or 1km (1995) of a bus route.  
 Number of telephones per 1,000 persons  
 % of population serviced by piped water  
 % of population serviced by electricity  
 % of urban population serviced by sanitary sewerage.

## Social Infrastructure Development Standards and Targets by Type of Area

### 1) Primary schools

As the population of urban areas increases, it will be necessary to provide many more primary schools and expand existing ones as well so that each school will have a capacity of 560 pupils, the total number of primary schools reaching a minimum of 89 by the target year 1995. As a rule, each division center and each rural village will be provided one primary school, and where pupils live farther than 2 km from these schools, small branch schools will be provided.

### 2) Dispensaries

In urban areas dispensaries will be provided at the rate of one for every 4,000 - 5,000 persons, which means that 56 will be needed by the target year 1995 owing to urban expansion. As a rule, each division center and each rural village will be provided one dispensary, a total number of 434 being necessary by 1995, including existing dispensaries that will be upgraded.

### 3) Multi-purpose stores

As a rule, each village will be provided with one multi-purpose store at its center, which means that 419 will be needed by 1995, including existing ones that will be upgraded.

### 4) Water supply

The following table gives water accessibility standards for different areas of the region.

Distance to water tap	Distribution system	Type of area
0 m	Private house connection	4 towns and 15 division centers
Less than 250 m	Cluster connection	High-density rural areas
Less than 500 m	Domestic water point	Medium-density rural areas
Less than 1,000 m	Domestic water point	Low-density rural areas

The following table gives the percentages of urban population that will be supplied with purified water by private house connections by the different target years.

	Present	By 1980	By 1985	By 1995
Moshi town	60%	78%	88%	100%
Same	40%	68%	89%	100%
Sanya Juu & Mkuu	0	0	0	100%
Division centers	0	0	0	100%
All urban areas	45%	67%	65%	100%

The following is the schedule for improvement of the type of water supply for urban and high-density rural areas.

	Present	By 1980	By 1985	By 1995
Sanya Juu & Mkuu	A	A	B	C
Division centers	A	A	A	C
High-density rural areas	A	A	A	B

Remarks: A - Domestic water stands  
 B - Cluster connections  
 C - Private house connections

The following table gives the percentages of rural population in different areas that will have water supply connections within 500 m by each target year.

	Present	By 1980	By 1985	By 1995
High-density areas	60%	80%	100%	100%
Medium-density areas	30%	60%	80%	100%
Low-density areas	10%	40%	60%	100%
All rural areas	38.1%	65.8%	86.5%	100%

### 5) Sanitary sewerage

The following table gives the percentage of the population of each town that will be serviced by a sanitary sewerage system by each target year.

	Present	By 1980	By 1985	By 1995
Moshi Town	30%	48%	65%	100%
Same	0	25%	50%	100%
Sanya Juu & Mkuu	0	0	0	50%
Average for the 4 towns	20%	35%	50%	90%

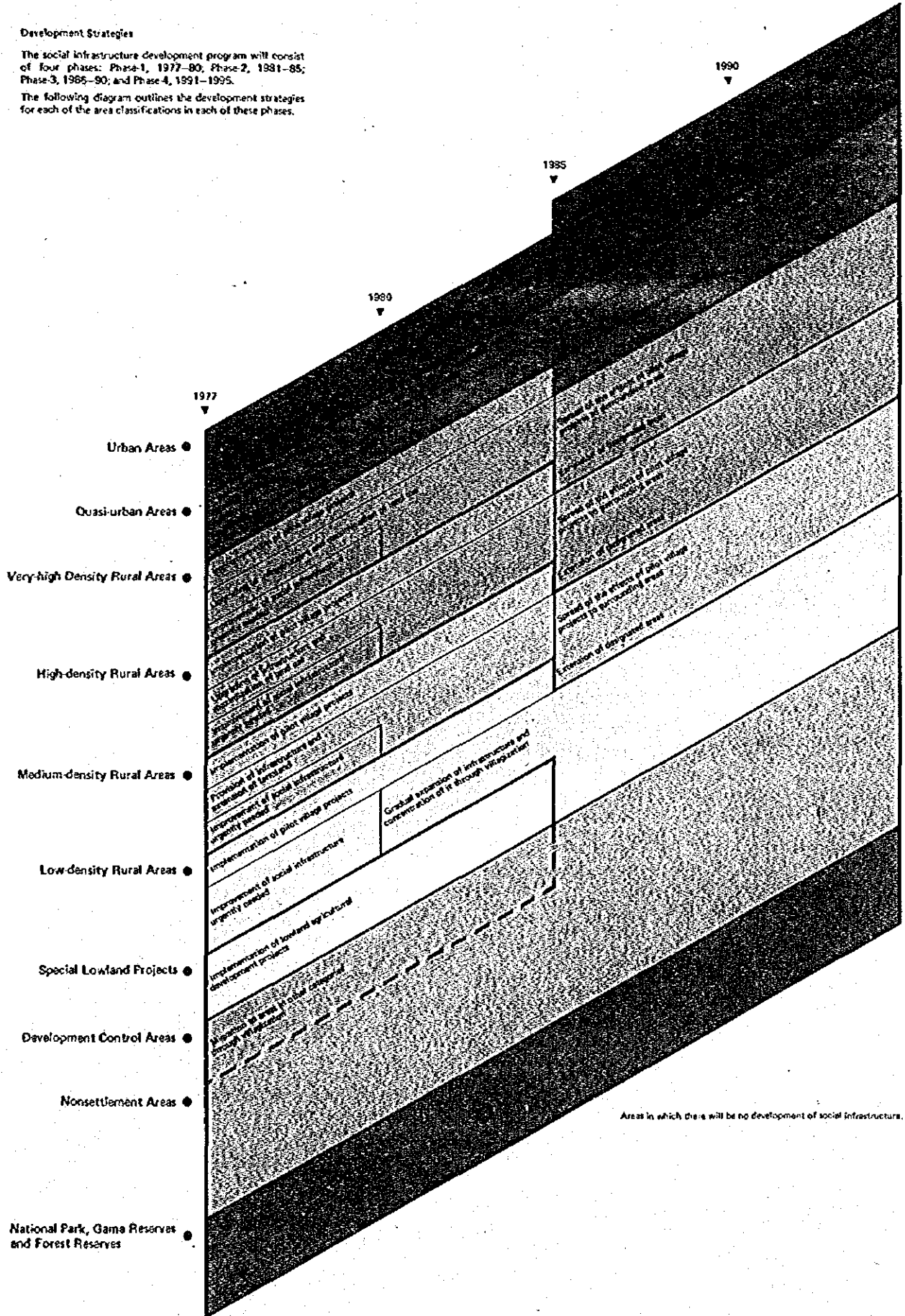
# SOCIAL INFRASTRUCTURE DEVELOPMENT STRATEGIES

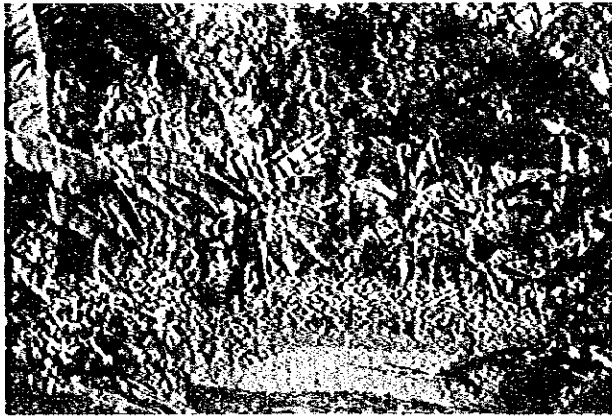
1995

## Development Strategies

The social infrastructure development program will consist of four phases: Phase-1, 1977-80; Phase-2, 1981-85; Phase-3, 1986-90; and Phase-4, 1991-1995.

The following diagram outlines the development strategies for each of the area classifications in each of these phases.





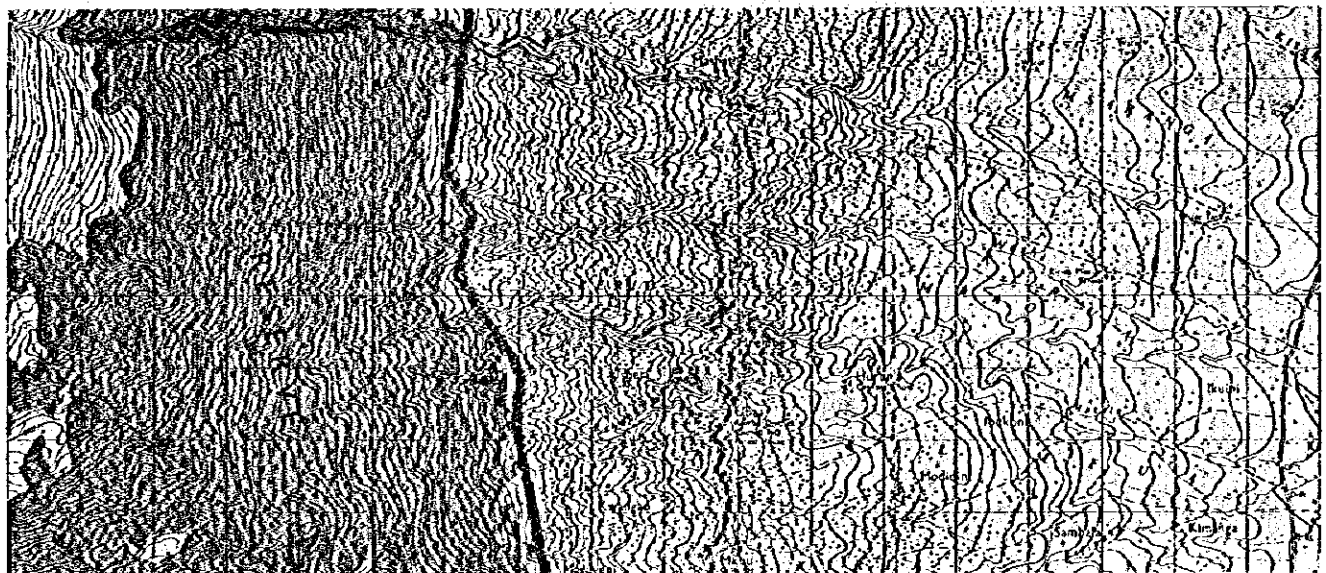
#### Coffee and Banana Cultivation

Mixed cultivation of the food crop bananas and the cash crop coffee makes for effective use of the available farm land and protects coffee from the direct rays of the sun. Thanks to this type of farming, kihamba lands are able to support a high population density.

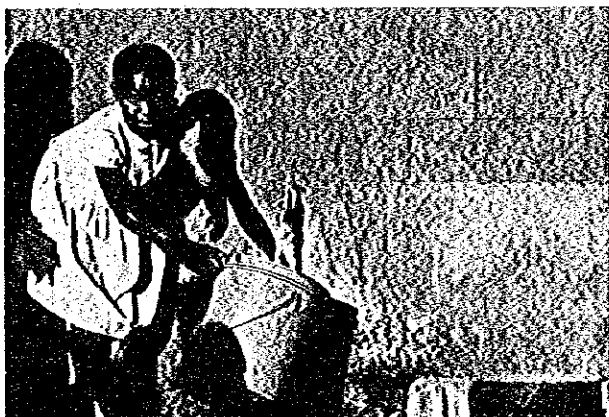


#### Ujamaa Village Children

The Ujamaa village is a cooperative community in which people live and work collectively. Dancing on the square in front of the assembly house.



#### Typical Eastern Slope Area of Mt. Kilimanjaro



#### Public Water Stands

Presently people in the region get their water from rivers and streams, boreholes, and water pipelines. In highland and upper lowland areas and district centers there is on the average one public water stand for every square kilometer.



#### Dwellings

Traditional thatched roofs are giving way to corrugated galvanized iron roofing, walls are now being built with concrete blocks and earth, and families are occupying two or more huts instead of just one as they used to do in the past.