

### 3. PRESENT STATE OF INDUSTRIAL DEVELOPMENT IN KILIMANJARO

#### 3.1 General Picture of the Industrial Sector in Kilimanjaro

##### (1) Overall Profile

##### (i) Existing Industries and Their Characteristics

There exist a few more than 36 kinds of industries in the Region of Kilimanjaro. Specific profiles of their activities are shown in Table 1 on the basis of our field survey. Most of those industries process primary products of agricultural and forestry. These 36 industries have been categorized in the "Classification of Manufacturing Industries" in an attempt to identify specific characteristics of the industrial structure, and one can easily see which industries the region lacks. They are paper and paper products, most chemical products, glass and glass products, basic metal products such as non-ferrous metals, iron and steel, and fabricated metal, and machinery and equipment. In other words, there are practically no capital goods and intermediate goods manufacturing industries and only a very limited number of industries manufacturing durable and semi-durable consumer goods.

Most of those missing industries are, then, what are called "basic industries," basic in the sense that they can contribute to the future industrial development of the region. On the other hand, among the existing industries of Kilimanjaro, those which are most basic are the metal working, engineering, and automobile workshops, which are exclusively located within the area of Moshi Township.

Thus, the industrial development of Kilimanjaro can be viewed as highly unbalanced. This also means that relationships among various industries are very limited. Although this does not necessarily imply that all such industries have to be established within the region, it does suggest the broad direction of industrial development.

(ii) Development Stages of Existing Industries

The present state of industrial development can also be viewed in terms of the historical development of the stages of the production system. Industrial production has increased with the development of the following production systems combined with technical progress.

- household manufacturers
- village handicrafts
- artisans' workshops
- primitive factories
- "assembly lines and the continuous flow process"
- "semi-automatic and automatic factories"

At any stage of industrial development of a country or a region like Kilimanjaro there exists a particular combination of all those production systems. Although it is an awfully difficult task to determine the optimal combination of such systems, the case of Kilimanjaro shows a phenomenon of polarization between small-scale production units (household manufacturers, village handicrafts and artisans' workshops) and modern production lines (assembly lines and the continuous flow process, and semi-automatic and automatic factories). The former group accounts for more than 90 per cent of the existing industries of the region. Thus, a very crucial production system, the primitive factory, which is believed to play an important role in bridging the gap between the former and the latter group in many ways, is seriously lacking. A lack of industrial inter-linkage between the large and small units is quite apparent in Kilimanjaro.

### (iii) Economic Indicators

One method of indicating the developmental situation of a sector is by means of particular economic indicators. However, in developing countries fundamental data and information are so seriously lacking that such indicators are not available. Fortunately, our field survey in Kilimanjaro enabled us to solve this problem. We can now, therefore, see some characteristics of existing industries in terms of (a) average fixed capital investment per unit undertaken in the past, (b) average number of employees per unit, (c) capital/labor ratio and (d) gross output of the regional manufacturing (industrial) sector (Table 1).

First of all, the average fixed capital investment undertaken per unit has been estimated at approximately Shs. 280,000, of which Shs. 150,000 represents investment in machinery and equipment and Shs. 130,000 represents investment in factory and office buildings. These relatively large figures are mainly due to large, modern or capital-intensive industrial units such as sisal processing units, textile goods units, a plywood unit and a construction and engineering unit. When these large units are excluded from the averaging procedure, the average fixed capital investment become Shs. 115,000, of which Shs. 70,000 went to machinery and equipment investment and Shs. 45,000 went to investment in premises.

Secondly, the average number of employees per unit (excluding only the 4,000 employees of Tanganyika Planting Company) is approximately 40. When total employment is adjusted by deducting all questionable estimates of the number of employees (mostly sisal estate labourers), the figure drops from 40 to 26 or 27. If the large, modern industrial units mentioned above are excluded the average employment figure further declines by more than 10 employees.

Thirdly, the computed capital/labor ratio in terms of capital value per labourer is a little lower than Shs. 7,000, of which about 55 per cent represents machines/equipment investment. This capital/labor ratio, interestingly enough, shows some correspondence to the figures (Shs.8,580) for "other necessities" and "textiles," as the main industrial activities of Kilimanjaro as reported in a paper prepared by Prof. J.F. Rweyemamu in 1971. When one takes into consideration the fact that the latter figure is based on industrial units of more than 10 employees, which are supposedly more capital intensive than smaller units, one can expect the degree of correspondence to be much closer.

The present gross annual output of the industrial sector of Kilimanjaro is estimated at approximately Shs. 133,690,000, based on our field survey. Assuming that our survey coverage of industrial units in terms of production volume was 70 per cent as a whole, we obtain an approximation of total Gross Regional Output of Shs. 191 million, referring to figures given in the 1970 and 1972 "Survey of Industrial Production."

Economic Characteristics of Existing Industries (Table-1a)

Existing Industries	No. of Units	Fixed Investment Costs (Machines/Equipment vs. Factory Buildings)	Monthly Operation Costs	Employment	Monthly Wages/Salaries per Employee	Production per Month
1 Coffee Pulpery	4	117,650 23,000	7,940	16	267	23,000 kg
2 Rice & Maize Mill	9	19,000 6,000	2,000	3	312	13,500 kg
3 Sugar (Jaggery)	1	-	-	100	-	27,200 kg
3'Sugar (Refined)	1	-	-	4,000	500	400 ton
4 Sisal Processing	6	600,000 200,000	68,000	240	303	40 ton
5 Livestock Feeds (Maize)	1	150,000 40,000	40,000	10	380	290 bags x 50 kg
6 Cotton Ginning	1	345,000 35,000	35,000	16	375	500 bales
7 Calabash Goods	1	19,000	3,863	11	130 (Trainees)	4,000
8 Lamp Shade	1	-	1,400	3	350	28 units (or 2,500)
9 Mosquito Coils	1	200,000	60,000	105	400	250,000
10 Hide & Skin (Tanning)	1	120,000 45,000	20,830	8	625	22,000
11 Leather Goods	5	34,000 100,000	61,000	50	348	88,000
12 Saw Mill	12	93,000 46,000	39,000	30	399	68,000
13 Carpentry	13	18,000 33,000	6,900	16	425	99,000
14 Plywood	1	2.7 million 5.8 million	258,000	243	-	380,000

(Table-1b)

Existing Industries	No. of Units	Fixed Investment Costs (Machines/Equipment vs. Factory Buildings)	Monthly Operation Costs	Employment	Monthly Wages/Salaries per Employee	Production per Month
15 Furniture	5	22,000 77,500	9,800	9	543	12,000
16 Vehicle Bodies	1	-	5,000	12	292	6,000
17 Crates	1	500,000 105,000	125,000	42	420	170,000
18 Gypsum	1	-	-	120	-	42,000
19 Bricks (Cement & Natural Brick)	5	3,200	12,000	6 (12)	414	13,000
20 Pottery (including burnt bricks)	4	500	-	17	250	4,400
21 Gravel	1	18,000	11,440	4	260	26,000
22 Tin & Black-smithing	4	5,500 2,000 - 3,000	1,000	3	-	2,000
23 Metal-Working	5	40,000 54,000	3,500	7	479	4,450
24 Engineering	2	200,000 130,000	8,500	5	720	12,000
25 Auto-Workshops	4	35,000	38,000	32	444	50,000
26 Bakeries	6	- 52,500	55,430	15	386	56,000
27 Tailoring	8	10,000	18,500	16	140	24,300

(Table-1c)

Existing Industries	No. of Units	Fixed Investment Costs (Machines/Equipment vs. Factory Buildings)	Monthly Operation Costs	Employment	Monthly Wages/Salaries per Employee	Production per Month
28 Textile Piece Goods	4	339,000 146,000	655,000	153	530	560,000
29 Soft-Drink Bottling	1	- -	350,000	55	402	450,000
30 Sweets & Confectionary	1	200,000 70,000	-	38	391	170,000
31 Retreated Tires	1	90,000 -	140,000	15	740	100,000
32 Cooking Fat	1	150,000 25,000	530,000	45	356	-
33 Salt Grinding	1	90,000 -	-	6	500	-
34 Chemical Goods Packing	1	20,000 72,000	4,000	10	390	-
35 Soap Making	1	- 60,000	-	8	380	-
36 Construction & Civil Engineering	1	3,000,000 270,000	900,000	69	423	-

## (2) Geographical Distribution of Industries

Industrial distribution in the region of Kilimanjaro is discussed here by examining the data collected in our field survey. To visualize the distribution of industries more clearly, this problem is tackled from two angles: distribution of industries between the four districts and characteristics of industrial distribution within each district.

### (i) Industrial Distribution by District

Distribution of industrial units among the districts is shown in Table 2. This table presents industrial distribution in terms of kinds of industries. In spite of the fact that the survey did not cover all industrial units, some characteristics are clearly shown. Moshi District has the highest percentage, 40.8 per cent, among the four. As the percentage of industrialization in rural Moshi is believed to be lower than in the rest of the districts, Moshi District may even increase its percentage rate in real terms. Rombo District and Pare District follow Moshi District with 22.5 per cent and 21.6 per cent, respectively. Industrial units in Rombo and Pare are roughly equally distributed. Although Rombo District is smaller than Pare District in area, this phenomenon is quite understandable for the following reasons. First, population is quite similar in both districts. In other words, a similar amount of local demand for industrial products has long existed. Second, both districts are far from the major industrial centre, urban Moshi. Rombo is much nearer than Pare. But what counts in measuring the distance is accessibility to destinations. Although the Rombo road is an all-weather road, it does not yet have a tarmac cover, while Pare has a main tarmac road running through it. Consequently, driving time to the centres of the Rombo and Pare districts is about the



same. The fact that both districts are far from the Moshi centre necessitated the creation of a similar number of industries in order to satisfy the demand of the local population. The fourth ranked district is Hai. As Hai is a very new district, which was separated from the old Moshi District only in 1975, and as this part of Kilimanjaro has long been a large plantation farming area, it is understandable that the number of existing industrial units is quite small. In other words, Hai District is for the most part covered by the industrial activities of urban Moshi. As a result, the survey revealed that Hai District only accounts for 15 per cent of the industrial units surveyed.

(ii) Industrial Distribution by Specific Resources

Classification of industries shown in a vertical manner in Table 2 is in three steps. Firstly, the whole industrial sector is broadly divided into two groups: "Industries Based upon Local Resources" and "Industries Based upon Outside Resources." This method of grouping is important in discussing the future industrial development of Kilimanjaro. Secondly, these two groups are divided into six sub-groups according to specifically identified resources. The group of "Industries Based on Local Resources," then, consists of "Crop-based Industries," "Livestock-based Industries," "Forestry-based Industries" and "Clay and Mineral-based Industries." The last group consists of "Metal-based Industries" and "Non-metal-based Industries." Thirdly and finally, those sub-groups are divided once again into 36 specific kinds of industrial units.

Distribution of crop-based industries is even except for the intensive sisal processing activities in Pare. This sub-group accounts for 21.7 per cent of the total. Livestock industries are very few in number and exist around

industrial growth poles such as Himo, Usseri and Same. There are only three tanneries in the whole region: one in Moshi Town, one in Himo (rural Moshi) and one in Usseri (Rombo). As for leather goods, however, the statistics should be looked at with some caution since self-employed manufacturers of leather goods, mostly shoemakers, have not been included in the statistics. If they are included, the number of livestock-based industries will increase substantially. This sub-group constitutes 5 per cent of all existing industries. The third sub-group of local resource-based industries, forestry-based industries, shows an interesting feature. Sawmilling and carpentry (including furniture making) activities are common in all districts and are more or less evenly distributed among the districts. Here, once again, when self-employed carpenters are included in the statistics, the number of forestry-based industries doubles. Another point contains more sophisticated and technologically intensive forestry-based industries such as plywood, furniture and fixtures, and crates. This sub-group accounts for 27.5 per cent. The last sub-group of clay and mineral-based industries is very unevenly distributed. One of the main reasons for this is that they are mostly dependent upon local sources for minerals.

Commercially-exploited clay and minerals are very limited. Pottery and burnt bricks are produced in Hai and Pare. Gypsum is mined in Pare, and gravel is dug in Rombo. Cement bricks are produced in Hai, Moshi and Rombo. Natural bricks would be exploitable at a more intensive level in lower Rombo with proper measures. The share of this sub-group is 9.2 per cent.

The first sub-group of the last group, metal-based industries, is fundamentally related to the level of regional industrial development, as metal-based industries are closely tied to most manufacturing industries and therefore often regarded as the key to accelerated industrial development. The region of Kilimanjaro, then, needs to put more emphasis on promoting these industries. The statistics show that all lower stages of blacksmithing and tinsmithing are practiced in Moshi, Rombo and Pare. Metal-working units are found at a rate of one unit in each district on the average. The urban Moshi metal-working unit is, needless to say, the most advanced. Some more sophisticated metal-based industries such as engineering and auto-repairing are active in urban Moshi. This, in turn, suggests that when machines and equipment break down, they or the broken parts have to be sent to urban Moshi, unless there are special workshops capable of repairing them within the industrial units themselves. This sub-group accounts for only 13.3 per cent in spite of its fundamental importance as an industrial accelerator. The other sub-group of non-metal-based industries is considered to cover a large variety of industries. The statistics, however, only cover 9 industries. Baking and tailoring industries are very common in all the districts. Tailoring units in Rombo and Pare are of this nature. Textile piece goods industries include sisal and kenaf bags and garments. All the other industries listed here exist in urban Moshi, which indicates that urban Moshi is the centre of industrial production of the region. This sub-group accounts for 23.3 per cent of existing industrial units in Kilimanjaro.

As a summary of the above discussion, Table-3 can be viewed horizontally. Ranking among the districts by industrial categories is clearly indicated. The rankings are as follows, in descending order. Crop-based industries:

Pare, Moshi, Rombo, Hai. Livestock-based industries: Moshi, Hai, Rombo, Pare. Clay-and mineral-based industries: Rombo, Pare, Hai, Moshi. Metal-based industries: Moshi, Pare, Rombo, Hai. All industries: Moshi, Rombo, Pare, Hai.

(iii) Industrial Distribution within Each District

(a) Hai District

Let us now look at the distribution of industry from a second angle, that of distribution within each district. This can be discussed vertically in Table 2, district by district, starting with Hai. In Hai, there are fewer industrial activities than in the other three districts. The distribution of industrial activities in Hai is, therefore somewhat difficult to categorize. There are only two crop-based industries (11.1 per cent) and no livestock industries. Forestry-based industries relatively active, have 3 units (16.6 per cent). There is only one metal working unit (5.6 per cent). This can be attributed to the fact that we did not survey self-contained workshops on large estate farms. In the field of non-metal-based industries, one bakery unit was observed. That completes the list of industries in this district. One of the most important reasons for this low level of industrial activity is, as mentioned above, that Hai has long been within the reach of economic and industrial activities of Moshi.

(b) Moshi District

In Moshi District, we consider that it is more proper to analyse the statistics without separating the district into two sub-districts. One of the reasons for this is, as pointed out before, that industrial

activity in the rural Moshi sub-district is assumed rather low. Moshi District, then, shows very distinct characteristics in its distribution of various industrial units. First, no clay or mineral-based industries exist there. The sub-group of crop-based industries accounts for 16.3 per cent and is characterized by the large-scale Tanganyika Planting Company (TPC - sugar estate and refinery) and a sole coffee-curing enterprise (Tanganyika Coffee Curing Co., Ltd.). In addition, Moshi has the value-added production of animal feeds and pyrethrum products (mosquito coils, etc.). Livestock-based industries are more active than in the other districts, but only account for 8.2 per cent of Moshi's industries. This, however, does not mean that their production activities are insignificant. On the contrary, both tanning units and leather goods units are on quite a large scale by Tanzanian standards.

In these industries one can easily see that the technological level of processing is reasonably high. The forestry-based industries are characteristically distributed. Saw mills are more or less similarly equipped as those in other districts except that the production scale in urban Moshi is much larger. No carpenters as furniture manufacturers. As a matter of fact, township carpenters are producing more refined and precision products than rural carpenters. Industrial diversification, e.g. plywood, vehicle bodies and crates, is quite apparent in urban Moshi. This sub-group constitutes 26.5 per cent of Moshi's industrial units.

The first sub-group of the latter group, the metal-based industries, shows a concentration of industrial engineering and automobile repairing activities.

Thus, Moshi has long been the centre of repairing and engineering activities in the Region. This sub-group accounts for 19.6 per cent of Moshi industries. The second and last sub-group can now claim an urban diversification of industrial activities. Seven of the nine kinds of industries do not exist in rural districts (including the rural Moshi sub-district)

This phenomenon may suggest some limitations as well as possibilities in the development of the industrial sector of Kilimanjaro Region. Industrial development has centred around urban Moshi owing to the fact that physical infrastructural facilities are available and the physical distribution system is well-established, with urban Moshi the very center of the distribution network. Thus, this sub-group accounts for a full 41.7 per cent.

(c) Rombo and Pare Districts

Rombo and Pare, in spite of the large difference in geographical characteristics, show somewhat similar distribution patterns. The relative importance of crop-based industries is 22.2 per cent in Rombo and 38.5 per cent in Pare. The high rate of the latter can be attributed to the historical fact that Pare has been a sisal production centre and has therefore established quite a few sisal processing factories. Livestock-based industries account for 7.4 per cent in Rombo, while there is no such industrial unit in Pare. The case of Pare would seem to imply that livestock resources are too scarce. But as a matter of fact, Pare's livestock resources are second only to Moshi. One of the reasons for the lack of livestock-based industries in Pare is that Pare people

tend to keep livestock animals only as property and not as commercial goods. There are forestry-based industries in both districts, and their positions are 22.2 per cent and 11.5 per cent in Rombo and Pare, respectively. The reason why the rate of Pare is half that of Rombo is that forest reserves are ranges and are relatively small due to climatic conditions in Same. The sub-group of clay and mineral-based industries accounts for 18.5 per cent in Rombo and 11.5 per cent in Pare. This discrepancy is mainly due to the fact that Rombo has four cement brick-making units since people there are very keen on building cement block houses.

Three metal-based industries exist in each district. They account for 11.1 per cent and 11.5 per cent in Rombo and Pare, respectively. A unique characteristic is that both districts have one metal-working unit each, both of which must have emerged from urgent local demand. As for the non-metal-based industries (baking, tailoring, etc.), the varieties of such industries in urban Moshi do not exist in either of these two districts. Hence, it is possible to introduce a variety of industries oriented to local markets here. This last sub-group accounts for 18.5 per cent in Rombo and 26.9 per cent in Pare.

A vertical view of Table 3 summarizes the above discussion. Industrial activities in Hai can, then, be ranked, according to sub-group classification, in the following order: Forestry-based, Clay- and Mineral-based, Metal-based, Non-metal-based, and finally livestock-based. In Moshi: Non-Metal-based, Forestry-based, Crop-based, Metal-based, Livestock-based. In Pare: Crop-based, Non-Metal-based, Clay- and Mineral-based, Metal-based, and Livestock-based.

Industrial Distribution by District (Table-2)

Availability of Resources	Kind of Resources	Category of Industries	Hat Survey	Township Survey	Moshi Rural Survey	Rombo Survey	Pare Survey	Total
Industries Based on Local Resources	CRDP-	Coffee Pulpery	1		1	1	1	4
		Rice Mill		** 2			** 3	** 5
		Maize Mill				4	(1)	4(5)
	BASED	Sugar Jaggery			1		1	2
		Sisal Processing	1		1		4	6
	INDS.	Feed (Maize)		** 1				** 1
		Cotton Ginning					1	1
		Calabash Goods				1		1
		Lamp Shades			1			1
		Mosquito Coils		1				1
		Sub-Total	2	4	4	6	10	26
	LIVESTOCK-							
	BASED	Hides and Skins				1		1
		Leather Goods		** 3	1	1		5
		Sub-Total		3	1	2		6
	FOREST-BASED	Saw Mills	4	2	2	3	1	12
		Carpentry	7		1	3	2	13
	INDS. (cont'd)	Plywood		1				1
		Furniture		5				5
		Vehicle Bodies		1				1
		Crafts		1				1
		Sub-Total	11	10	3	6	3	33
	CLAY AND MINERAL-BASED	Gypsum					1	1
		Brick (Burnt)	2					2
		" (Cement)				4	1	5
	INDS.	Pottery	1				1	2
		Gravel				1		1
		Sub-Total	3			5	3	11
Industries based on Other than Local Resources	METAL BASED	Tin, Blacksmithing				2	2	4
		Metal Working	1	1	2	1	1	6
	INDS.	Engineering and Auto-Workshops		2				2
				4				4
		Sub-Total	1	7	2	3	3	16
	NON-METAL BASED	Baking	1	1		1	3	6
		Tailoring				4	4	8
	INDS.	Textile Piece Goods		4				4
		Soft-drink Bottling		1				1
		Sweets and Confectionary		* 2				2
	NON-METAL-BASED (cont'd)	Retreated Tires		1				1
		Cooking Fat		1				1
		Chemicals		* 3				3
		Building & Civil Engineering		2				2
		Sub-Total	1	15		5	7	28
		Total	18	39	10	27	26	120



Order of Industrial Activities (Table-3)

Industries	Hai	Moshi	Rombo	Pare	Total (Region)
Crop based Industries	4	2	3	1	
	3	3	1	1	3
Livestock based Industries	3	1	2	3	
	6	5	6	6	6
Forest based Industries	2	1	3	4	
	1	2	2	3	1
Clay and mineral based Industries	2	4	1	2	
	2	6	3	3	5
Metal based Industries	4	1	2	2	
	4	3	5	3	4
Non-Metal based Industries	4	1	3	2	
	4	1	3	2	2
Total (Region)	4	1	2	3	

Finally, when the figures are compiled at the regional level, the ranking order becomes Forestry-based, Non-Metal-based, Crop-based, Clay- and Mineral-based and Livestock-based.

### (3) Industrial Units by Size

Definition of "size" is a major problem among economists, politicians and administrators. For purely practical purposes, it may be wise to divide the industrial sector into three kinds of industries: large-scale industries, medium-scale industries and small-scale industries. We also define small-scale industries as including handicraft and cottage industries. Our definition of large-scale industries is those which have 51 or more employees, medium-scale industries are defined as those which have 11-50 employees, and small-scale industries are defined as those which have 1-10 employees.

#### (i) Unit Distribution by Size

Following the above definition, our survey is summarized in Table 4. The total number of small-scale industries is 58, which accounts for 48.3 per cent of all industries surveyed in the region. Regarding their distribution, Moshi ranks first, Rombo second, Pare third, and Hai last. But interestingly enough, the shares of Moshi, Rombo and Pare are more or less even. This high degree of small-scale industrial activities, at least in terms of number, confirms their relative importance in the development of the regional industrial sector. Medium-scale industrial units number 39 which accounts for 32.5 per cent. The figure decreases substantially in the case of small-scale industries. In terms of medium-scale industries alone, Moshi ranks way out in front with 48.7 per cent, Hai comes next with 20.5 per cent, followed by Rombo with

12.8 per cent. From this one may easily see that in the rural areas of Kilimanjaro, activities of medium-scale industries are far fewer than in urban Moshi. In statistical terms, there are 22 medium-scale units in the three rural districts of Kilimanjaro, which account for only 18 per cent of the total industrial units surveyed. The large-scale industrial sector is also led by Moshi (more specifically, urban Moshi). Large-scale industries account for 16.7 per cent of all existing industrial units in Kilimanjaro. There are no large industries in Hai, while Pare District has a fairly large number of sisal-processing industries whose activities have recently been for the most part not very brisk owing to low prices in the international sisal market. There are only two large-scale units in Rombo District, and they account for only 8.3 per cent of large-scale industry.

(ii) Pattern of Industrial Development by Size of Enterprise

Industrial development is a continuous process of expanding existing industries and establishing new industries. Although industrialized and industrializing countries have experienced different types of industrial development, most countries have an industrial size distribution in which large-scale, the medium-scale and the small-scale industries form a pyramid. If this is also to be the case of Tanzania, it is necessary that existing small-scale industries be brought into the medium-scale industrial sector and/or that high priority projects for medium and small-scale industries be introduced, keeping in mind that large-scale industries are quite difficult to introduce into this region owing to various factors described elsewhere. For these reasons, then, when we look at Table 4, urban Moshi is found to have the most favourable pattern for industrial development.

Breakdown of Industries by Size (Table 4)

Number of Employees	Hai	Moshi		Rombo	Pare	Total
		Urban	Rural			
1 - 10	8	14	5	18	13	58
11 - 50	8	17	2	7	5	39
51 -	0	8	3	2	7	20
Total	16	39	10	27	25	117

#### (4) Ownership and Organization

Another question to be considered in the course of industrial planning is the kind of ownership that should be encouraged. The answer has already been given by the authorities: a cooperative form of industry-producer cooperative-is that which has to be supported, promoted and encouraged within the framework of Ujamaa socialism. This policy has long been in effect in one form or another, and some effects of it are already in evidence.

##### (i) Types of Ownership and Organization

Ownership and organization can be broadly categorized into three types according to our survey: parastatal, cooperative and private. Parastatal organizations are those which are owned by the Government of Tanzania and are therefore to a large extent nationalized. Cooperative organizations are those which are formed and run through cooperative and collective efforts of local people. Finally, private organizations are those which have been organized through individual efforts and are therefore owned by private individuals. They are further subdivided into individual proprietorships and partnerships.

(ii) Distribution of Industries by Ownership and by Specific Type

Table 5 categorizes industrial distribution by ownership and by the specific kind of industry. Of 26 industrial units in the crop-based industrial sector, 5 units (or 19.2 per cent) belong to the parastatal sector, 12 units (or 46.2 per cent) to the cooperative sector and 9 units (or 34.6 per cent) to the private sector. One central reason why the cooperative sector is dominant is that the authorities have long supported the establishment of posho mills in rural areas by grants drawn from the Regional Development Fund of the Prime Minister's Office. The relatively high percentage that parastatal industries account for is due to the nationalization of sisal-processing units in Pare and Hai Districts. As a result, the private ownership sector accounts for only about 20 per cent. In the livestock-based industries, the private sector's activities rank first, accounting for 50 per cent of all livestock-oriented industries. The cooperative sector follows with 37.5 per cent. There is only one parastatal tannery unit in the region, Tanzania Tanneries Co., Ltd. With this, the parastatal sector accounts for 12.5 per cent. Next, in the sub-group of forestry-based industries, the cooperative sector leads the other two, accounting for 50 per cent, followed by the private sector with 40.6 per cent and the parastatal sector with 9.4 per cent. The leading role of the parastatal sector can be attributed to successful organization of individual carpenters into producer cooperatives. In the field of clay- and mineral-based industries, there are only 11 units altogether, of which 7 (or 63.3 per cent) belong to the cooperative sector and 4 (or 36.4 per cent) to the private sector. Here again the cooperative sector is most prominent. This can be explained by the successful introduction of the cooperative movement in the cement brick-making industries.

Metal-based industries are dominated by the private sector with 68.8 per cent, followed by the cooperative sector with 31.2 per cent. There are no parastatal metal-based industries in the region because of failure to implement governmental policy fully in this important industry. The final sub-group, the non-metal-based industries, is headed by the private sector with 57.1 per cent, followed by the cooperative sector with 39.3 per cent. There is only one parastatal unit (3.6 per cent), which manufactures sisal bags.

To sum up, let us examine the regional statistics. The aggregate statistical figures are shown at the bottom of Table 5. The parastatal sector embraces 9 industrial units (or 7.6 per cent), while the cooperative sector has 54 industrial units (or 45.4 per cent) and the private sector 56 units (or 47 per cent). The private sector is thus still dominant in production activities. Although the Government policy of encouraging the cooperative sector (and the parastatal sector) is well known (in fact there has been a very strong diversification drive toward producer cooperatives), it should be noted that the role of the private sector will be crucial for the industrial development of the region.

(iii) Ownership Distribution of Industries by District

Ownership distribution of existing industries at the district level is shown in Table 6. A particularly interesting feature is that the cooperative sector is far more important than the private sector in all the rural areas of Kilimanjaro, namely, Hai District, the Rural Moshi Sub-district, Rombo District and Pare District. Moshi's Urban Sub-district is the only area where the private sector is more important than the other sectors in nearly all fields. Thus government guidance of cooperative production on the basis of socialist philosophy seems to have

Ownership Distribution of Industries (Table-5)

Kind of Resources	Category of Industries	Parastatal	Cooperative	Private
Crop-based Industry	Coffee Pulphery		3	1
	Rice Mill			
	Maize Mill		) 7	) 2
	Sugar (Jaggery)			2
	Sisal Processing	2		2
	Feeds (Maize)			1
	Cotton Ginning		1	
	Calabash Goods	1		
	Lamp Shades		1	
	Mosquito Coils			1
		(5)	(12)	(9)
Livestock-based Industry	Hides & Skins	(1)	1	(1)
	Leather Goods		2	3
		(1)	(3)	(3)
Forest-based Industry	Saw Mills	1	5	5
	Carpentry	1	9	3
	Plywood	1		
	Furniture		2	3
	Vehicle Bodies			1
	Craftes			1
		(3)	(16)	(13)
Clay and Mineral-based Industry	Gypsum		1	
	Brick (Burnt)			
	(Cement)		) 4	3
	Pottery		1	1
	Gravel		1	
		(0)	(7)	(4)
Metal-based Industry	Tin & Black-Smithing			4
	Metal Working		4	2
	Engineering			2
	Auto-Workshops		1	3
		(0)	(5)	(11)
Non-Metal-based Industry	Baking		4	2
	Tailoring		6	2
	Textile Piece Goods	1		3
	Soft Drinks			1
	Sweets, Confectionary			2
	Retreated Tires		1	
	Cooking Fat			1
	Chemical Goods			3
	Construction & Civil Engineering			2
		(1)	(11)	(16)
	Total	10	54	56

had a penetrating and substantial influence on the rural population. This, however, does not necessarily mean that cooperative industries are better-managed than private industries.

Ownership Distribution of Industries by District (Table 6)

Types of Industries	Hai	Moshi		Rombo	Pare	Region (Total)
		Urban	Rural			
Parastatal	1	2	1	2	4	10
Cooperative	11	4	6	17	7	41
Private	4	30	3	8	5	50
Total	16	36	10	27	16	105

#### (5) Pattern of Industrial Growth in Kilimanjaro Region

As previously mentioned, the Kilimanjaro Region's economy is still, broadly speaking, a "monoculture economy" emphasizing coffee. And its industrial structure is dualistic and unbalanced in comparison with neighbouring Tanga and Arusha.

It is essential to determine whether the present structure is permanent or merely a stage in transition from the colonial period to a new industrialized stage. The following is an analysis of past trends in establishment of industrial units. Because of lack of relevant data, only the 1968 and 1975 editions of the Directory of Industries have been available for use.



(i) Four Phases of Industrial Growth

The yearly production figures stated in the Directory suggest that the Kilimanjaro region's industrial development may be separated into four phases: 1930-1935, 1936-1955, 1956-1968, and 1969-1975. It should be borne in mind, however, that this classification is tentative and needs more precise analysis. The characteristics of each period are as follows.

(a) 1st Period (1930-1935)

During this period, the British colonial period, Kilimanjaro's industrialization started. This, however, was the typical colonial pattern of collection and processing of local primary products such as coffee, sugar, and leather.

(b) 2nd Period (1936-1955)

During this period additional locally abundant resources such as woods began to be exploited on a very small scale. Table-7 shows that of fourteen industrial units, six were related to the wood industry (see Detailed Table in Appendix).

Number of New Establishments in Each Period (and each year on the average) (Table 7)

Period	I	II	III	IV
	3	14	31	10
	(0.5)	(0.7)	(2.4)	(1.4)

(c) 3rd Period (1956-1968)

The 3rd period is from 1956 up to the First Five-year Plan. During this period the rate of industrialization was accelerated in terms of a number of consumer goods industries like confectionery, soft drinks, textiles, etc. which were oriented to replacing imports. Most of these industries were privately owned.

(d) 4th Period (1969-1975)

This accelerated rate seems to have continued up to 1968, after which it again declined, as shown in Table 7, to 1.4 new units per year. But more important than increase in units has been structural change as stated in the Arusha Declaration, 1967.

This has meant change in the kind of industries. Resource-oriented industries like tanning, sisal bags, plywood, carpentry, etc., began to be promoted. However, this period is quite different from the 1st and 2nd periods in that these activities were established mostly by public corporations or parastatals instead of by individual or foreign investors.

(ii) Summing Up

At present the Kilimanjaro region is suffering somewhat from industrial stagnation. This is definitely the case even in comparison to neighboring regions.

However, despite this general profile of the industrial sector of the region, we see a new and steady trend of other industrial growth since the Villages and Ujamaa Villages Act of 1975 took effect: the emergence of small industrial developments centering on cooperative industries.

In future industrial development in the Kilimanjaro region these village industries (usually in the form of cooperatives) can be expected to play a major role if they can overcome the many constraints that they face.

### 3.2 Surrounding Conditions

#### (1) Industrial Administration System

On the basis of the government's classification of industries, industrial policy, too, can be divided into three categories.

The first is policy concerning large and national industries, most of which are under the control of public corporations such as NDC, TEXCO, TWICO, the National Sugar Corporation, STAMICO, etc. However, there are some exceptions in the form of large industries which are still privately owned. The major national industries in the region are as follows:

NDC:	Tanzania Tannery, Tanzania Bag Corporation, East African Kenaf Industries.
TWICO:	Moshi Plywood
Private:	Tanganyika Planting Company, Kibo Match Corporation

In general, the management, technical, and financial problems of these industries are handled centrally. In this sense, they are less connected with local and regional institutions. However, according to our survey, even in large industries technical development is very weak.

The second category is district industries, which are producing a high proportion of basic consumer goods, mainly for local demand. At present, most of them are privately owned and geographically concentrated in Moshi. In the future, the government intends to place them under the control of the District Development Corporation. However, at the moment those

industries in this region under DDC control are very limited in number.

In the Kilimanjaro Region there are four District Development Corporations: KIDECO (Moshi District), RODECO (Rombo District), PADECO (Pare District), and HAIDECO (Hai District). Their major activities are as follows. KIDECO runs a bus company and coffee estate. RODECO is involved with poultry, a soft drink distributorship, and gypsum mining. HAIDECO has no business yet since it was only recently established (see Table 8).

Each DDC is managed by its own board of directors in close cooperation with the Prime Minister's Office and regional office. As to financial structure, 25% of all funds is provided by PMO, and the rest by the National Bank of Commerce. The Small Industries Development Organization provides technical guidance.

As for private small and medium industries, technical and management guidance is undertaken by SIDO, and some pricing guidance is given by a regional commercial officer. Since the industries can generally stand on their own feet, they are not very dependent on others, except for technical guidance.

The third group is village industries, including co-operative industries. Recently, these industries have mushroomed, especially because the village have been empowered to establish industries as one of its economic activities. In fact, the government, too, has placed great emphasis on the development of these rural industries through various institutions.

However, a great number of difficulties confront them. In spite of the government's active and intensive assistance, it is difficult to overcome problems such as lack of capital and technical know-how and poor marketing. The basic constraint seems to be lack of technical know-how, which is to blame for under-utilization of machinery and equipment, poor marketing and financing difficulties.

Although at present the government is making great efforts to remove this basic constraint and to accelerate indigenous village industries, more intensive and more systematic technical guidance is required. Otherwise, these mushrooming village industries will perish before long.

Killimanjaro DDC's Third Five Year Plan - 1976-1980/81 (Thousand Shillings) (Table-8)

Project Name	Total Costs of Project			Exp. upto '75/'76, '76/'77		1977/1978		1978/1979		1979/1980		1980/1981			
	Govt. Equity/Grant	Other Sources	Total	Govt. Equity/Grant	Other Sources	Govt. Equity/Grant	Other Sources	Govt. Equity/Grant	Other Sources	Govt. Equity/Grant	Other Sources	Govt. Equity/Grant	Other Sources		
3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
KIDECO															
1. Goat farming	110.4	331.3	441.7	-	-	-	-	110.4	331.3	-	-	-	-	-	-
2. Garage Construction	25	75	100	-	-	-	-	25	75	-	-	-	-	-	-
3. Glue making	37.5	112.5	150	-	-	-	-	-	-	-	-	37.5	112.5	-	-
4. Saw Mills	300	900	1,200	-	-	-	-	-	-	300	900	-	-	-	-
5. Burnt Bricks	25	75	100	-	-	-	-	-	-	25	75	-	-	-	-
Sub-Total	497.9	493.8	1,991.7	-	-	-	-	135.4	406.3	325	975	37.5	112.5	-	-
RODECO															
1. Pig Farming	146.3	438.7	585	-	-	-	-	146.3	438.7	-	-	-	-	-	-
2. Pencil Manufacture	81.5	244.4	325.9	-	-	-	-	81.5	244.4	-	-	-	-	-	-
3. Saw Mill	625	1,875	2,500	-	-	-	-	-	-	625	1,875	-	-	-	-
4. cado Pear Oil	25	75	100	-	-	-	-	-	-	-	-	-	-	25	75
5. Wholesale Shop	500	1,500	2,000	-	-	-	-	-	-	500	1,500	-	-	-	-
Sub-Total	1,377.8	4,133.1	5,510.9	-	-	-	-	227.8	683.1	112.5	337.5	-	-	-	-
HAIDECO															
1. Burnt brick making	33.6	100.8	134.4	-	-	-	-	33.6	100.8	-	-	-	-	-	-
2. AnnahotCaffia Project	121.4	364.2	485.6	-	-	-	-	121.4	364.3	-	-	-	-	-	-
3. Transporter Project	80	240	320	-	-	-	-	-	-	80	240	-	-	-	-
4. Housing Estate	250	750	1,000	-	-	-	-	-	-	250	750	-	-	-	-
5. Lime Extraction	15	45	60	-	-	-	-	-	-	-	-	15	45	-	-
Sub-Total	500	1,500	2,000	-	-	-	-	135	465	330	990	15	45	-	-
Total	2,375.7	7,126.9	9,502.6	-	-	-	-	518.2	1,554.4	1,780.0	5,340.0	52.5	157.5	25	75

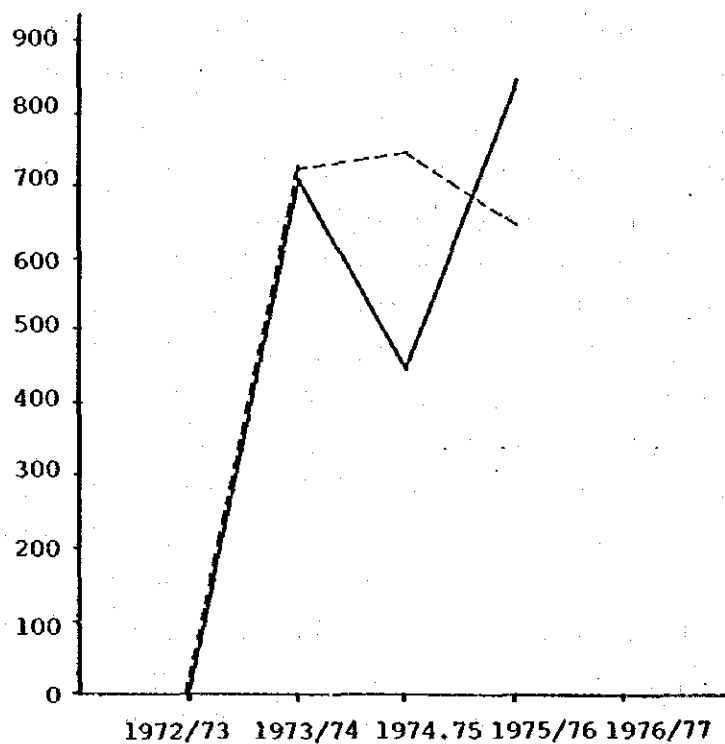
## (2) Government Finance

Fig.-1 shows the budgetary allocation for industrial development. In fiscal 1972/73 there was no allocation at all, which is very surprising in view of Kilimanjaro's industrial development potential. From 1973/74 on, the budgetary allocation has maintained about the same rate of increase, especially in terms of the approved estimates, which have fluctuated in the vicinity of 700,000 shillings. Actual expenditures, on the other hand, have fluctuated widely. In 1974/75 the actual expenditure was only 60 per cent, while in 1975/76 the industrial sector overspent its estimates by 31.8 per cent. These figures, however, perhaps do not pose a real problem. What is probably more serious is the percentage share in the total development budget, which has ranged between a high of 4.7 per cent and a low of 2.3 per cent in actual expenditure. This is additionally supported by evidence of extremely low allocations to the industrial sector in the regional recurrent budget, ranging from 0.08 per cent to 0.16 per cent in actual expenditure.

In Fig.-2 the RDF allocation to Kilimanjaro is shown for fiscal 1970/71-1976/77. After 1970/71 the R.D.F. grew more or less steadily, but then it dropped substantially. This, we feel, must have been due to lack of specific regional strategy and project preparation. Although the allocated R.D.F. is not meant to be used solely by the industrial sector, once strategy and careful preparation of projects are established, it would be advisable and feasible to utilize the presently available R.D.F., which is a little over Shs. 1 million, systematically and with special emphasis for industrial development.

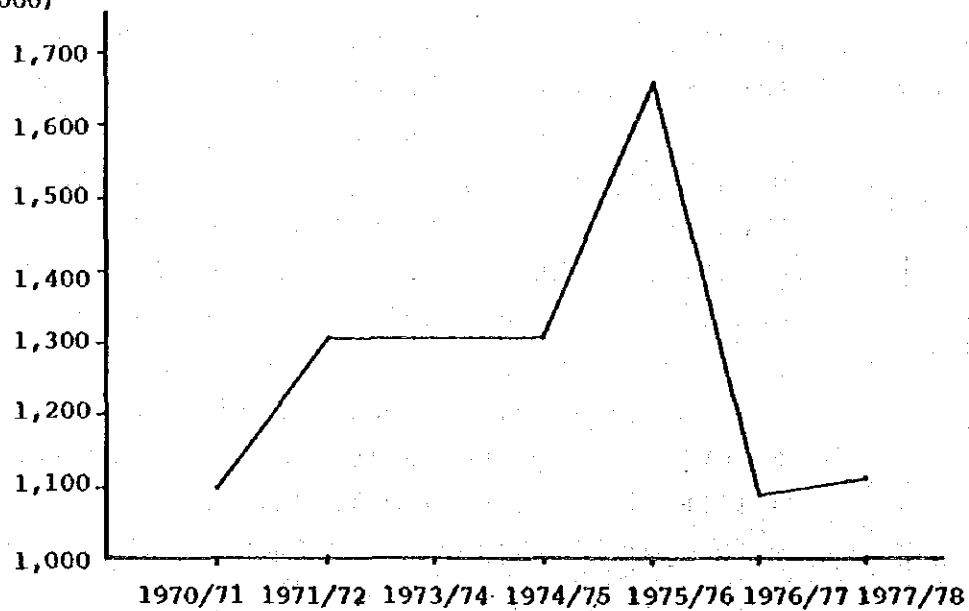


(Shs.000) Regional Development Budget of Industrial Sector (Fig.-1)



— Actual Expenditure  
 - - - Approved Estimates

(Shs.000) Regional Development Fund (R.D.F.) (Fig.-2)



### (3) Technological Institutions

#### (i) Profile

Present institutions for creating industrial technicians can be roughly divided into two groups: formal educational systems and informal educational systems. The former includes the Technical Secondary School, Technical College and the University of Dar es Salaam.

In the Kilimanjaro region there is Moshi Technical Secondary School in Moshi Town, which has courses in mechanics, woodworking and automobiles. However, though the Technical Secondary School is located in Moshi, its students also come from outside the Kilimanjaro region. Nevertheless, the existence of this Technical Secondary School is very relevant to the region and surrounding areas in that it can provide, to some extent, personnel for local industries.

Therefore, when considering direct supply of technicians for the industries of the region, the role of informal training institutions is important. In this category are such public technical institutions as the Post-Primary Technical School and the Rural Training Center supported and supervised by the Prime Minister's Office, the Ministry of National Education and the Regional Office. In addition, there are training centres run by the Small Industries Development Organization (SIDO) of the Ministry of Industries.

#### (ii) Regional Training Institutions

The Post-Primary Technical Schools aim at keeping young people in villages to work for rural development by providing them with schooling. There are two in Moshi District, two in Hai District, four in Rombo, and four in Pare District. The subjects taught there, are, in line with rural development, carpentry, masonry, and domestic science.

There are two Rural Training Centres in the Kilimanjaro Region (one in Same, the other in Msinga, Moshi District). The kind of courses depends on the requirements of the applicants. Some examples, are food, agriculture, live-stock and domestic science. The courses are short, and the number of students is not fixed. Naturally, the objective of the centre is rural development in line with government policy.

At present, there are SIDO training centres at Usangi, in the Pare District, and at Useri, in the Rombo District. The former deals with pottery making, metal-working and wood-working. The latter deals with calabash products such as tea pots. These training centres are expected to be very effective in providing training in basic skills and in encouraging rural industrial development.

In addition to these institutions, there are some private training institutions. Among them, the Kilacha Production and Training Centre in Himo, Moshi District, is unique and promising.

They at present specialize in making instruments for poultry hatching, and they plan to expand in the future. Further, in conjunction with the Tanganyika Parents' Association (TAPA), there are training centres in Minja, Pare District, and in Mashati, Rombo District. Their major subjects are carpentry, automobile mechanics and masonry. The length of the course is four years. The Kilimanjaro Youth Technical Training Centre in Mandake, Moshi Town, is managed by missionaries, as is the Kilacha Production and Training Centre. It is being transformed into a secondary school, and its main subjects are carpentry and mechanics. Finally, there is the mechanics course at Marangu Farm School, run by the UMCA. The YMCA is planning additional courses after the completion of a new building.

#### (4) Industrial Registration and Taxation

Industries which are registered with the revenue office are generally those which appear in the Directory of Industries and Survey of Industrial Production, which are annually published by the Bureau of Statistics. Those industries are categorized as medium and large-scale manufacturing industries. Practically no studies, except ours, have so far been made on small-scale industries which employ fewer than 10 people. Our survey revealed that most small-scale manufacturing units are not registered with the revenue office. This has two important policy implications. Firstly, the regional authorities concerned have not had any real data and information concerning small-scale industries, so they have had difficulties in small-scale industrial planning and, in turn, in implementing the plans. Secondly, the Treasury cannot lay foundations for establishing solid revenue sources from the small-scale manufacturing sector. With respect to this latter point, some might argue that present small-scale industries are too small to pay a corporation tax considering not even practice book-keeping. Consequently, one might argue that taxation discourages new investment of small-scale entrepreneurs. But this is not the case. Taxation is not for discouragement of industrial activities but for absorption of a certain margin of profits for more equitable use in the economy. We do not intend to discuss the meaning of taxation here. But what we would like to stress is that the revenue office does not yet have an application form for a business license, particularly for the manufacturing sector. This type of registration system is urgently needed.

Rather than taxation, we are interested in subsidization to industries to encourage investment activities, i.e., in investment incentives. However, before we discuss some measures to encourage investment, let us touch upon a point regarding taxation. If the authorities should levy a tax on small-scale industries, it would be totally unmanageable if it were of the ad valorem type. A unit type of tax is recommendable. As for investment incentives, there are four types of measures to stimulate investment: (1) reduction in the rate of corporate profits tax, (2) accelerated depreciation, (3) tax holidays and (4) investment credit. To compare the effectiveness of those measures is not, however, our business on the regional scale that we are concerned with.

Technical Institutions with Special Reference to Kilimanjaro Region (Table-9)

Run By	Name	Main Location	Subject/Period of Study	No. of Students	Means of Selection	Grade Level	Purpose
PMO/Region	Post Primary Technical School	Moshi	2 Carpentry 2 Masonry	149	Post-primary school, many applicants, somewhat competitive		to remain in village and to work for rural development
		Hai	4 Domestic Science	65			
		Rombo	2 years	325			
		Pare	$\frac{4}{12}$	309			
Ministry of National Education	Rural Training Centre	Same	1 Depending on requirements of applicants, e.g. food, agriculture, livestock, domestic service 3 - 9 months	not fixed	generally, after primary school but regardless of age./preferably, recommendation by D.D.D.		
		Msinga	$\frac{1}{2}$	generally twenty students per class			
Ministry of Industry/SIDO	Training Center (1) Usseri Calabash T.C.	Usseri, Rombo	Calabash/12 Crafts months				
	(2) Industrial Workshop	Usangi, Pare	Pottery, Metal Working/3 months				
Missionary (Catholic)	Kilacha Production and Training Centre	Kimo, Moshi	Instruments for				
"	Kilimanjaro Youth Technical Training Centre	Mandaku, Moshi	Carpentry, Mechanics				
Tanganyika Parents (TAPA)	TAPA Training Centre	Minja, Pare	Carpentry Mechanics				
		Mashati, Rombo	Masonry/4 years				After primary School
YMCA	Marangu Farm School	Marangu, Moshi	Mechanics				under preparation

GOVERNMENT SCHOOLS

PRIVATE SCHOOLS

## (5) Industrial Employment

As far as population in the industrial sector is concerned, there have been no reports on how many people are actually engaged in the sector. The only available data has been that included in the Industrial Survey, which, however, lists only those industries that employ more than 10 people. Our survey, fortunately, enables us to make a fairly accurate estimate of the number the workers in the industrial sector in the Kilimanjaro Region.

### (i) Employment in Existing Industries by Employment Group

Employment in existing industries by employment group is shown in Table-10, which is summarized conveniently according to the size of industries. The small employment category of 1-10 employees corresponds to small-scale industry. Similarly, the medium employment category of 11-50 employees corresponds to medium-scale industry, and the larger employment category of 51 or more employees corresponds to large-scale industry. The small-scale industrial sector employs 311 employees, or 3.8 per cent of all industrial employees, which in turn represent 11.8 per cent of regional employment. The large-scale industrial sector has 6,970 employees, or 84.2 per cent of the total. This high proportion large-scale industry - or uneven distribution of employment - is largely due to the fact that the Tanganyika Planting Company (sugar estate and factory) employs 4,000 workers. When this special case is excluded from the statistics, employment distribution from the small to the large becomes 7.2 per cent, 22.9 per cent, and 69.4 per cent, respectively. But even in this latter case it is clear that large-scale industry is by far the most effective in absorbing the labor force. Nevertheless, it is very difficult to establish new large-scale industries in Kilimanjaro by regional initiative because of the following reasons:

- (a) Large-scale industry often requires large amounts of foreign exchange, which is not abundantly available.
- (b) National policy has already determined some specific goals of large-scale industrial development.
- (c) Moshi has been less successful than the neighboring regions of Arusha and Tanga in introducing and developing large-scale industries.
- (d) It is quite difficult to find resources for large-scale industrial development within the region.

(ii) Employment Distribution by Industry Groups and by Types of Ownership/Management

Employment distribution by specific industries and by types of ownership/management is shown in Table 11. Distribution of employment in crop-based industries proves that the private sector creates an overwhelming portion of employment. Of the 5,695 persons employed in crop-based industries, the private sector accounts for 4,718 (or 82.8 per cent), the cooperative sector for 213 (or 3.7 per cent), and the parastatal sector for 764 (or 13.4 per cent). The major reason for this unbalanced distribution is that TPC has 4,000 employees. Livestock-based industries employ 216 people, 44 (or 20.5 per cent) in the cooperative sector 171 (or 79.5 per cent) in the private sector. Here again, the private sector dominates. In forestry-based industries, 898 people are employed and they are fairly evenly scattered among the parastatal sector (41.6 per cent), the private sector (32.2 per cent) and the cooperative sector (26.1 per cent). Clay and mineral-based industries account for 256 employees, 58.7 per cent of them in the cooperative sector and 41.3 per cent in the private sector. Metal-based industries have 209 employees, of which 144 (or 68.9 per cent) are in the private sector and 65 (or 31.1 per cent) are in the cooperative sector. The final



sub-group of the non-metal based industries employs 1,114 workers, of which 522 (or 46.9 per cent) are in the private sector, 372 (or 33.4 per cent) in the parastatal sector, and 220 (or 19.7 per cent) in the cooperative sector.

When the employment figures of the three sectors are viewed as a whole, it can be seen that of the total employment of 8,385 workers, the private sector accommodates 5,949 (or 70.9 per cent), the parastatal sector 1,510 (or 18.0 per cent) and the cooperative sector 926 (or 11.1 per cent). These figures clearly show that the distribution of industrial units by ownership/organization does not correspond to distribution of industrial employment. Although the number of existing producer cooperatives is almost equal to that of private industries, the total number of employees in producer cooperatives is less than one-sixth of that in private industries. The aggregate figures, together with this single comparative example indicate that in spite of the fact that the Government puts most emphasis on cooperative production and parastatal production, the private sector plays by far the more important role in employment.

If Table 11 is analysed vertically, the inter-industrial group distribution of employment can be observed. Crop-based industries are most important with 5,695 employees (67.9 per cent) in a total employment of 8,385. Next come non-metal based industries with 1,114 employees (13.3 per cent). Forestry-based industries are in third place with 898 (10.7 per cent) employees, followed by clay and mineral-based industries with 254 (3.0 per cent), livestock-based industries with 215 (2.6 per cent), and metal-based industries with 209 (2.5 per cent). This ranking in itself may have some employment implication in planning and programming projects. But more important is the fact that Kilimanjaro's industrial employment is mostly accounted for by agriculture-based industries in the broad sense of

the term, while metal-based industries, which are considered to be very basic for future industrial development, account for the smallest amount of employment.

(iii) Employment Distribution by District

Employment distribution by district is shown in Table 12. Moshi district is divided into Moshi Urban and Moshi Rural. In the upper row, figures are sorted out simply by adding up our field survey data in each district and sub-district. According to this data, Moshi Rural accounts for 4,373 (or 52.1 per cent of total regional employment of 8,385), which is by far the highest employment figure. Moshi Urban is in second place, followed by Pare with 1,452. Hai and Rombo account for only 407 and 385, respectively. The fact that Moshi Urban does not rank first may seem strange, but this is simply due to the fact that TPC has 4,000 employees. Pare, too, has an unexpectedly high employment figure. This is due to its 5 large sisal estates. In an attempt to grasp the real industrial employment situation, figures in the lower row have been adjusted in the following manner:

- (a) In Hai, employees working in sisal estates 100 has been excluded.
- (b) The 4,000 employees of TPC have been excluded from the employment figure for Moshi Rural.
- (c) Sisal estate labourers, together with 90 casual workers in a tailoring unit (1,047 in all), have been subtracted from the Pare employment figure.

The figures in the lower row of Table 12 thus give a more realistic picture of employment distribution. Moshi Urban now ranks first with 1,770 employees, followed by Pare with 405, Rombo with 385, Moshi Rural with 372, and Hai with 307. The high employment figure for Moshi Urban indicates a much higher level of industrial activity than

Employment by Size of Industrial Unit (Table-10)

Employment group	No. of industrial units	Total employment	
		(%)	(%)
1- 10	59	50	311
			7
			3.8
11- 50	39	33	980
			11.8
			8.5
51-100	6	5	419
			5.1
101-500	13	11	2,551
			30.8
501-	1	1	4,000
			48.3
Total	118	100	8,281
			100.0

Employment Distribution By District (Table-12)  
(Numbers of Employees)

	Moshi				
	Hai	Urban	Rural	Rombo	Pare
Unadjusted	407	1,770	4,372	385	1,452
Adjusted	307	1,770	372	385	405

Employment Distribution of Industries by Type of Ownership (Table-11)

Availability of resources	Kind of resources	Category	No. of employees			Total
			Parastatal	Cooperative	Private	
Industries Based on Local Resources	Crop-based ind.	Coffee Pulphery	-	47	80	127
		Rice Mill	-	21	3	24
		Maize Mill	-	-	-	-
		Sugar (Jaggery)	-	-	4,100	4,100
		Sisal Processing	737	142	420	1,299
		Feeds (Maize)	-	-	10	10
		Cotton Ginning	16	-	-	16
		Calabash Goods	11	-	-	11
		Lamp Shades	-	3	-	3
		Mosquito Coils	-	-	105	105
		Subtotals	764	213	4,718	5,696
	Livestock-based ind.	Hides and Skins	-	8	-	8
		Leather Goods	-	36	171	207
		Subtotals	0	44	171	215
	Forest-based Ind.	Saw Mills	125	67	163	355
		Carpentry	6	184	48	202
		Plywood	243	-	-	243
		Furniture	-	20	24	44
		Vehicle Body	-	-	12	12
		Crates	-	-	42	42
		Subtotals	374	235	289	898
Industries Based on Other Than Local Resources	Clays & Mineral-based ind.	Gypsum	-	120	-	120
		Brick (Burnt)	-	15	55	70
		(Cement)	-	-	-	-
		Pottery	-	10	50	60
		Gravel	-	4	-	4
		Subtotals	-	149	105	254
	Metal-based ind.	Tin & Blacksmith	-	-	11	11
		Metal Working	-	58	13	71
		Engineering	-	-	17	17
		Auto Workshop	-	7	103	110
		Subtotals	-	65	144	209
	Non-metal-based ind.	Bakery	-	30	32	62
		Tailoring	-	175	11	186
		Textile Piece Goods	372	-	241	613
		Soft-Drinks	-	-	55	55
		Sweets/Confectionary	-	-	38	38
		Retreated Tires	-	15	-	15
		Cooking-Fat	-	-	45	45
		Chemical Goods	-	-	16	16
		Construction & Civil Engineering	-	-	84	84
		Subtotals	372	220	522	1,114
	Grand Totals		1,510	926	5,949	8,385

in the other districts. Also, Rombo, Pare and Moshi Rural have very similar employment figures, and Hai is only slightly behind them.

#### (6) Natural Resources for Industrial Development

Existing natural resources in Kilimanjaro can be divided into 6 categories: agricultural resources, livestock/animal resources, forestry resources, mineral resources, fresh-water fish resources and nonutilized waste/scrap resources. Those resources are regarded here as natural resources and considered in the context of industrial uses.

##### (i) Agricultural Resources

Kinds of resources: Agricultural crops can be classified as either cash crops or food crops. Cash crops include coffee, cotton and cotton seed, sugar, sisal, seed beans, pyrethrum, castor, jaggery, sunflower and cardamon. Food crops include bananas, maize, mixed beans, finger millet, paddy (rice), wheat, cassava dry, potatoes (Irish), sweet potatoes, vegetables, and citrus and other fruits. Vegetables which are commonly on the market are carrots, radishes, onions, spring onions, cabbages, cauliflower, cucumbers, red and green peppers, okra, eggplant, spinach, peas and tomatoes. Fruits include bananas, avocados, pears, mangos, papaw, strawberries, apples, grapes, and such citrus fruits as oranges and limes.

Spatial distribution: Most of the main crops are produced within the coffee and banana belt between 1,000 m, and 1,500 m. Sisal, sugar, jaggery, castor, sunflower, finger millet and cassava are produced in the lower areas of Kilimanjaro. Wheat is produced only within the area of west Kilimanjaro (present Hai District), while rice is produced in southern Pare. Maize is most widely planted

from the highlands to the lowlands where the rainy season is long enough to provide enough water.

**Production and consumption:** Production of marketed crops of Kilimanjaro is as listed in Tables 13 and 14, quoted from the agricultural sector report. All those crops are normally marketed through particular channelling organizations such as N.M.C., T.C.A., and Village Cooperative Societies (former primary societies). But most of the crops are consumed locally either by farmers themselves or via nearby open air markets. The proportion of local consumption is amazingly high, as shown in Table 13. The main reasons for this seem to be that most of the farmers can only produce as much as they consume and that crop prices set by the Government for those organizations are lower than locally prevailing market prices.

**Industrial utilization:** When natural resources are industrialized, two types of industry are involved: input-related industries, which exploit or increase resource production and output-related industries, which are mostly processing industries. Our discussion here deals only with the latter type in order to avoid unnecessary duplication of discussion of industrial utilization of natural resources.

There are a number of agricultural processing industries in Kilimanjaro, including coffee curing and pulping, cotton ginning, sisal processing, jaggery and sugar production, maize and rice mills and an edible oil extraction facility under construction in Same. Most of the other crops and vegetables and fruits are sold fresh without being processed at all. It would therefore be recommendable to introduce new industries based on other agricultural products such as a unit for making starch from potatoes and sweet potatoes, a unit for making marmalade from citrus fruits and sugar, a unit for making tomato puree, and a dried fruits manufacturing unit.

Production of Cash Crops in 1975/76 (Table-13)

Crops	Hai	Moshi	Rombo	Pare	Total
Coffee	6,025	12,053	7,952	1,041	27,072
Cotton	162	326	-	237	778
Sugar	-	49,103	-	-	49,103
Sisal	260	1,017	-	3,190	4,467
Seed Beans	800	-	-	-	800
Pyrethrum	44	-	3	-	47
Castor	31	10	-	30	71
Jaggery	-	200	-	400	600
Sunflower	20	48	-	10	78
Cardamon	1	2	0.5	29.5	33

Production of Food Crops 1975/76 (Table-14)

Crops	Unit: Ton				
	Hai	Moshi	Rombo	Pare	Total
Banana	78,000	140,000	85,000	16,000	319,000
Maize	10,000	8,000	6,000	4,000	28,000
Mixed Beans	700	1,000	300	500	2,500
Fingermillet	700	350	700	50	1,800
Paddy Rice	50	400	-	3,750	4,200
Wheat	6,531	-	-	50	6,581
Cassava	800	800	600	1,000	3,200
Potatoes (Irish)	6,870	80	2,500	50	9,500
Sweet Potatoes	800	1,200	800	1,200	4,000
Vegetable	1,000	1,000	400	600	3,000
Citrus Fruits	10	40	20	30	100
Other Fruits	60	50	40	300	450

In planning those new industries, our main problem is that we do not know the available volumes of such crops. Continuous supply of the crops must be assured before any such industrial projects can be started. There is also another additional problem envisaged in this regard. The farmers are quite well off producing coffee and bananas, and most of the crops needed for new processing industries can only be produced within the coffee and banana belt. As long as coffee enjoys very high prices on world markets, farmers will be reluctant to plant other crops in the coffee and banana belt.

(ii) Livestock/Animal Resources

Kinds of resources: As livestock/animal resources, we can only list cattle, goats, sheep, chickens and hens, pigs, donkeys, and bees. Although there are also wild animal resources, we shall only touch on them very briefly as they are not meant for regular production and consumption.

Spatial distribution: Cattle are distributed quite widely and evenly throughout the region, and the higher the altitude, the greater the proportion of dairy cattle. Chickens/hens are also found all over the region, while goats and sheep are found in the middle and lower lands. Pig raising is not very popular, probably for religious reasons. There is beekeeping Rombo and Pare. For the last several years, however, honey collection has been very low because of severe drought.

Production and consumption: Production of meat, poultry, milk and eggs is given in Table 16 from the IRDP livestock report. Demand seems to be greater than supply as evidenced by the fact that sometimes there is no meat available on the market in Moshi Town for a week or so. The potential meat supply capacity would seem to be considerable, however, except for pork, the problem being that livestock is



kept by farmers as property instead of being sold on the market. Almost all consumption is very near production sites, except for NAFCO milk in Hai District. Therefore the local livestock market has remained underdeveloped.

**Industrial Utilization:** As output-related industries, there are only the (hide and skin) tanning industry and the leather products manufacturing industry. However, it would be highly feasible to establish a blood-powder producing unit and a bone-powder producing unit by using livestock blood and bones which are presently thrown away, it being possible to utilize the products as livestock feed ingredients. In addition, as an input-related industry, a feed manufacturing unit can be recommended. There is only one chicken feed manufacturing unit in Moshi Town, but for the purpose of producing better quality livestock, much more diversified, yet local resource-oriented feed manufacturing industries should be established. As for honey, a honey processing industry (there is one unit in Tanga which industry would be recommendable, but these industries would be subject to the constraint of limited honey wax production. In addition to the above, by utilizing wild animal hides and skins and tusks and ivory, a curio and souvenir industry would be feasible, but there are already a few industrial units of this kind in Moshi Town. For this industry, the supply of raw materials would be one of the most serious problems.

### (iii) Mineral Resources

**Kinds of resources:** The main mineral resources so far found in the Kilimanjaro Region are sand and stone as building materials, and clay, rhodolite, limestone, mica, magnesite, rhodonite, quartz/felspar and gypsum.

**Spatial distribution:** The distribution of above-mentioned mineral resources is shown in Fig.-3. Of the 4 districts, Pare is the richest in such resources.

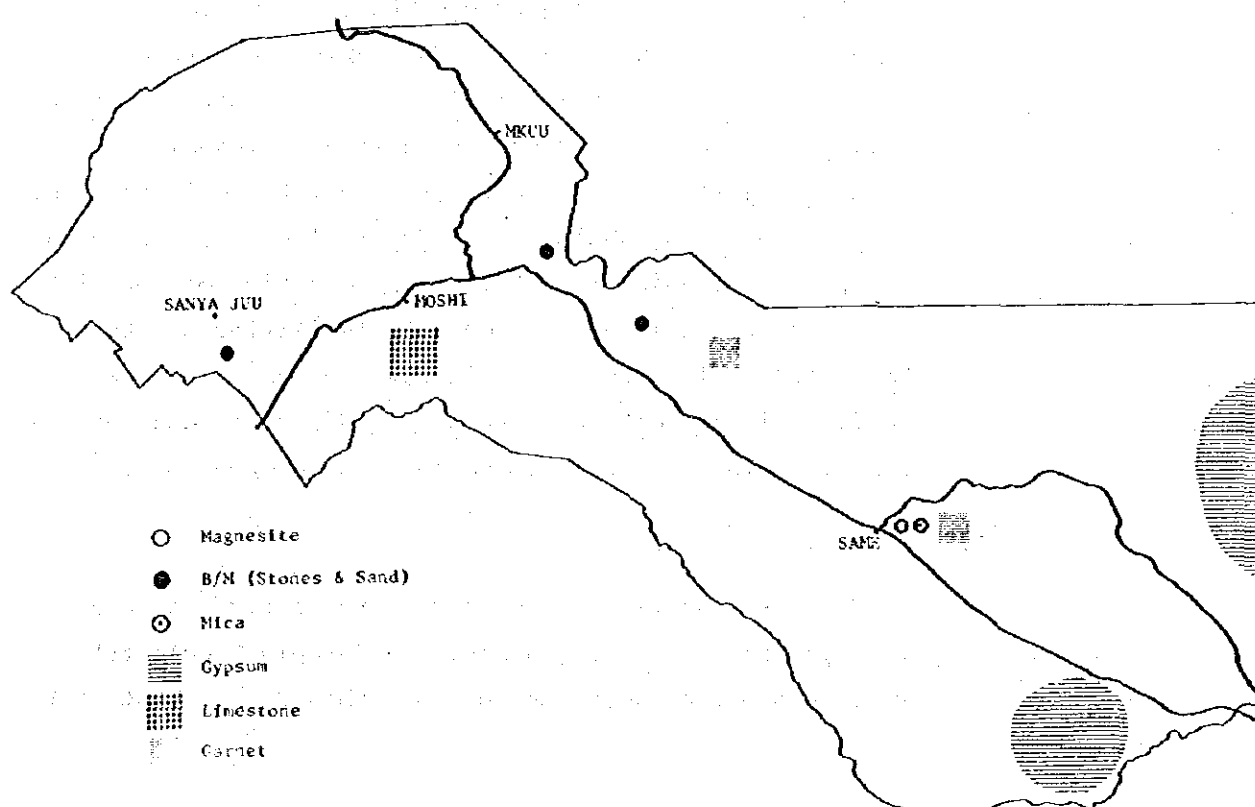
Livestock Resources by District in 1975/76 (Table-15)

Kind	Unit: Head				
	Hai	Moshi	Rombo	Pare	Total
Cattle	132,000	301,100	130,000	188,833	751,933
Goat	9,000	65,000	22,000	96,810	192,810
Sheep	20,000	28,500	10,500	40,211	99,211
Pig	4,000	4,185	4,000	115	12,300
Total	165,000	398,785	166,500	325,969	1,056,254

Consumption of Meat, Poultry, Milk and Eggs (Table-16)

	Hai	Moshi	Tombo	Pare	Total
Meat (kg)	852,492	1,117,166	710,440	664,479	3,404,514
Poultry (kg)	32,837	80,000	-	8,820	121,657
Milk (1,000 L)	-	-	-	-	69,000
Eggs (dozen)	41,800	100,000	12,628	49,910	204,347

Distribution of Mineral Resources (Fig.-3)



Production and consumption: There are three commercially exploited industries of this kind in the region: gypsum mining in South Pare, burnt brick/pottery making units in North Pare and Hai, and the natural stone brick industrial unit in lower Rombo. The gypsum mined is shipped to the Cement Manufacturing Factory in Dar es Salaam by train. Although the level of production is not known precisely, at one mine (according to our survey) it was reported to be 700 tons per month per unit. The natural stone brick industry produces bricks to be used as building materials just as cement bricks and burnt bricks are. In spite of the fact that natural stone deposits are very large, such production is fairly low. Apart from these three kinds of mineral resources presently under utilization, most other minerals are unexploited.

Industrial utilization: The natural stone brick making unit and the burnt brick/pottery making unit are the only units which shall be regarded as "manufacturing industries." The others belong to the "mining" industry, where very little if any processing is undertaken. Due to lack of intensive field investigation and surveys and research on utilization of yet unexploited mineral resources, nothing specific can be said at this stage concerning mineral-based industrial development. However, there is some possibility of establishing new industrial units, including a gypsum processing industry, for production of a variety of products requiring considerable facilities and technology. These industrial projects will have to come later as detailed field investigations have not been carried out yet, but some the mining industries could be developed soon.

#### (iv) Fishery Resources

Kinds of resources: The main commercial fish is *Terapia* (*Terapia Pangani*, *Terapia Jipe* and *Terapia Esculenta*), whose production accounts for more than 98 per cent of the

total fish catch of the Region. There are also some catfish (clarias) and, to a lesser extent, eels. In the streams high on Mt. Kilimanjaro, there are trout for sport fishing.

**Spatial Distribution:** The sole commercial fishing spot is Nymba ya Mungu. But there are some other self-consumption type of fishing sites in the region, including Lake Jipe, Kalimawe Lake (Dam), Lake Chala, and various fish ponds, as well as the trout streams mentioned above.

**Production and consumption:** Although production of Terapia has been decreasing over the last few years, as can be seen in Table 17, substantial amounts of Terapia and other fresh water fish have been supplied to local markets in the form of either smoked fish or dried fish. Although most of these fish are consumed within the Region, some fresh fish are marketed to other regions through Dar es Salaam by the National Cold Chain Store, which has one freezing unit at the Nymba ya Mungu Dam.

**Industrial utilization:** Fish processing has long been undertaken in terms of sun-drying, smoking and freezing. This can therefore be regarded as a kind of processing industry. Considering the present catch and state of processing, it would not be practical to think of establishing new fish processing industries such as fish canning. It would be better to upgrade already existing processing activities by reorganizing processing units systematically in an intensive and cooperative manner. In addition to this, there is some possibility of establishing a kind of repair shop for fishing gear and boats.

Annual Fish Catch at Nyumba ya Mungu Dam (Table-17)

	(unit:ton)				
	1971/72	1972/73	1973/74	1974/75	1975/76
Terapia				2,282.0	4,575.5

Nyumba ya Mungu and Other Major Fresh Waters in 1975 (Table-18)

	Fish Production in Tonnage	Value of Fish in Shillings
Nyumba ya Mungu	4,575.5	10,135,300/-
Lake Victoria	46,602.2	52,935,200/-
Lake Tanganyika	64,345.3	95,387,100/-
Lake Rukwa	3,102.7	2,836,500/-
Lake Nyasa	39,265.3	64,130,500/-
Lake Kitangiri	703.9	347,000/-
Total	158,594.9	225,771,600/-

(v) Forestry Resources

Kinds of resources: Timber resources can be broadly categorized into softwood and hardwood. In Kilimanjaro softwood consists of pines and cypresses (ceders), which are mostly planted through the efforts of forest authorities. Softwood consists of camphor and podo, which are natural vegetation. In addition to those four species, there is a greater variety of different species at lower altitudes, but for the most part it would be impossible to utilize them for industrial or commercial purposes.

Spatial distribution: Although forest reserves are scattered around Mt. Kilimanjaro and the Pare Mountains (Rau, Kahe, East Kileo, West Kileo, Minja, Mramba, Kindoroko, Vumari, Koko, Chambogo, Kiwilu, Kisiwani, Chongweni, Conia, Maganda, Kilanga, Chome and Kankoma), the main reserves are to be found on Mt. Kilimanjaro.

The timber reserves of Mt. Kilimanjaro are divided into three blocks: North Kilimanjaro, South Kilimanjaro and West Kilimanjaro, of which North Kilimanjaro produces softwood (pine and cypress), South Kilimanjaro produces hardwood only (podo and camphoe), and West Kilimanjaro produces both hardwood and softwood. In addition, the Pare Mountains produce hardwood only.

Available volume and consumption: The timber inventory of Kilimanjaro is approximately 5.2 million m<sup>3</sup>, of which 20,378 m<sup>3</sup> were taken from reserves in 1975. As villages where private ownership is preserved are not included, the actual figure could be considerably greater. Hardwood would appear to account for a greater proportion than softwood.

Even if this circumstance is taken into account, one would imagine the timber inventory to be large enough to amply meet future timber consumption. That is, however, not the case. Because it is generally assumed that only 20-30 per cent of the total timber inventory can be utilized, the rest of it having to serve various purposes such as water conservation, soil conservation and protection of the environment. If we assume, further, that the life span of a tree is 50 years, it can only be justifiable to exploit 30,000 m<sup>3</sup> per annum, and even at that only if reafforestation is continuously undertaken.

Thus, as shown in Table 19, there is a danger that actual timber exploitation exceeds the upper limit of real timber availability.

Timber Inventory, Actual Exploitation and Justifiable Exploitation in Kilimanjaro Region in 1975 (Table 19)

Timber Inventory	Actual Exploitation	Justifiable Exploitation
5,159,365 m <sup>3</sup>	20,378 m <sup>3</sup>	20,000 m <sup>3</sup> ~ 30,000 m <sup>3</sup>

Industrial utilization: Logs are utilized industrially in two ways: either by going straight to manufacturing factories such as plywood units or match manufacturing units or by going to local saw mills, where they are cut into different sizes and, in turn, sold to manufacturers, carpenters, building materials manufacturers, and so on.

Although one might imagine that the wood is being utilized to a maximum extent, actually there is leeway for greater industrial utilization. One possibility is a briquette manufacturing project utilizing sawdust as the main raw material.

(vi) Nonutilized Waste/Scrap Resources

Kinds of resources: This category embraces a variety of resources which are presently abandoned or wasted. Considering the scarcity of existing natural resources in Kilimanjaro, revitalization and reutilization of presently abandoned or wasted resources should be of considerable interest in industrial development planning. Included here are scrap metals such as metal sheets, steel bars, cast iron and nonferrous metal (mostly obtained from scrapped cars, machinery and equipment), sawdust and scrap wood easily obtained at sawmills, bagasse, sisal waste, used paper, used heavy oil such as engine oil and lubrication oil, rice bran and wheat bran, maize cog, scrap leather and kapok.

Spatial distribution: Most of those resources are to be found where there are related industries such as sawmills, sugar and jaggery manufacturing units, sisal estates, auto workshops and petrolstations, maize and rice mills and tanneries. The spatial distribution of those existing industrial units has already been discussed in an earlier subsection of this chapter.

Available volume: Availability of such resources is not known exactly. Nevertheless, they are believed to be substantial. For example, there is probably enough scrap metal available to supply a small forging unit and a small foundry unit for at least 5 years.

Industrial utilization: With respect to the future industrial utilization of these resources, the following industries should be considered:

- (a) Scrap metal --- a foundry unit, a forging unit, and a metal sheet processing unit.
- (b) Sawdust and scrap wood --- an egg-shaped briquette making unit and a charcoal making unit.



- (c) Bagasse --- a livestock feed unit and a paper manufacturing unit (using also sisal waste).
- (d) Sisal waste --- a paper manufacturing unit (using also bagasse).
- (e) Used oil --- a oil revitalization unit.
- (f) Rice bran, wheat bran and maize cog --- a livestock feed unit.
- (g) Scrap leather --- a curio products unit.

## 4. MAJOR CHARACTERISTICS AND PROBLEMS ENVISAGED IN THE INDUSTRIAL SECTOR

### 4.1 Employment

It has been pointed out by quite a large number of planners, regional and district officers, and scholars that industrial activities in Kilimanjaro are basically, as in most other regions of Tanzania, conducted by "the farmer with an industrial side job", and therefore the real number of industrial employees living solely on their industrial earnings is much smaller than is frequently shown by various surveys and statistics. The present state of employment presented earlier does not explain exactly the structure of industrial employment. Fortunately, our field survey has brought to light the respective percentages of all employees represented by permanent, casual and technical (skilled) employees.

#### (1) Employment Structure within the Industrial Sector

Statistics on employment structure obtained in our survey are presented in Table 13. The total number of employees is the sum of permanent and casual employees, and technical employees are included among permanent employees. Of a total of 3,930 employees (adjusted total), permanent employees account for 66 per cent (or 2,592) and casual employees for 34 per cent (or 1,338). A similar tendency is observed when this regional level analysis is separated into two groups: Moshi Urban and Rural Kilimanjaro (including Moshi Rural, Hai, Rombo and Pare). The employment structures of Moshi Urban and Rural Kilimanjaro are shown in Table 14. The proportion of casual labourers in the total employment of Moshi Urban is slightly lower than in the case of Rural Kilimanjaro, while

the number of technical employees in Moshi is twice as great as elsewhere in Kilimanjaro. This high ratio of casual employment can be explained from both sides of the labor market.

On the demand side, the entrepreneur is reluctant to employ casual laborers permanently for the following reasons: (a) they are very lowly skilled, if at all; (b) their workmanship is very irregular and unreliable; (c) casual laborers are much cheaper than permanent employees; (d) as the entrepreneur does not expect high skill levels of casual workers, production is not affected if he replaces them and it is not difficult to dismiss them when business falls off; (3) consequently, employers have no incentive to improve skill levels of casual workers and employ them permanently. On the supply side, the labor force has to accept casual labor conditions because of the following circumstances: (a) the supply of labor is very high owing to rapid population growth in recent years; (b) in spite of considerable availability of industrial labor, its quality and level of skill are believed to be fairly low; (c) during the nonagricultural dry season, many unemployed and underemployed workers drift to rural and urban industries, giving rise to the problem of seasonal urban migration in the latter case.

Such problems should first be tackled by upgrading the industrial skills of present and potential laborers in the region. Also welcome would be a change in attitude toward casual workers on the demand side.

## (2) Implications of the Present Structure

The large proportion of casual employment and the situation with respect to the labor market indicate that the real industrial population is much smaller than the apparent total. It may also be true that the quality of labor, too, is fairly low, as casual employees can be characterized as unskilled manual workers, and agriculture far outweighs industrial activities in the region. Only 184 employees, or 4.7 per cent of the total, were found to belong to the category of skilled manpower. This figure could turn out to be even lower if we set specific criteria for evaluating their skills and tested them. In Table 15 one of the questionnaire items of our survey, "Do you have any other source of income other than running the industrial unit?", is summarized by compiling "yes" and "no" answers given by all the units interviewed. At the regional level, of 116 persons polled 66 or, 57.4 per cent, answered "yes," which means that they are farmers with an industrial side job or industrial workers with side jobs (mostly in agricultural farming), while there were 50 "no" answers, supposedly representing industrial workers without any side jobs. In this connection, an additional look into a breakdown of statistical data between Moshi Urban and rural areas (Moshi Rural, Hai, Rombo and Pare) gives more distinct and interesting results. In Moshi Urban, 88.9 per cent (or 32 of 36 units) of industrial workers answered that they are not engaged in any other jobs for additional income, while 77.5 per cent (62 of 80) of rural industrial workers replied that they have side jobs (in some cases better described as main jobs) such as farming (most common) or work in shops, bars, or agencies. From this it can easily be argued that industrial development is led much more by Moshi Urban than by Rural Kilimanjaro.

The statement made at the beginning of this section has been verified in, except with respect to urban industrial workers. Three specific problems have been identified: a high proportion of casual labor in industrial activities; low availability of skilled manpower; and a comparatively low level of marginal income earnings in the industrial sector (especially the rural industrial sector) in comparison with the agricultural sector.

Employment Structures (Table-13)

Kind of Resources	Category of Industries	Employment Characteristics			Total			Adjusted total		
		Permanent	Casual	Technical	Permanent	Casual	Technical	Permanent	Casual	Technical
Crop-based Industries	Coffee Pulpery	38	89	0						
	Rice and Maize Mill	22	6	0						
	Sugar	4,080	20	0						
	Sisal Processing	769	430	(24)						
	Feeds (Livestock)	10	0	0	4,981	618	(24)	981	618	(24)
	Cotton Ginning	3	13	0						
	Calabash Goods	11	0	0						
	Lamp Shade	3	0	0						
	Mosquito Coil	45	60	0						
Livestock based Industries	Hide & Skin	5	3	(4)						
	Leather Goods	46	167	(3)	51	170	(7)	51	170	(7)
Forestry based Industries	Saw Mill	256	99	(7)						
	Carpentry	146	56	(17)						
	Plywood	223	20	(80)						
	Furniture	33	11	(5)	694	204	(111)	694	204	(111)
	Vehicle Body	4	8	(2)						
	Crates	32	10	0						
Clay & Mineral based	Gypsum	120	0	0						
	Brick	33	37	0	213	41	(0)	213	41	(0)
	Pottery	60	0	0						
	Gravel	0	4	0						
Metal-based Industries	Tin & Blacksmith	8	3	(6)						
	Metal Working	63	8	(12)						
	Engineering	9	0	0	170	25	(25)	170	25	(25)
	Auto Workshop	90	14	(7)						
Non-Metal based Industries	Bakery	73	19	0						
	Tailoring	39	147	(3)						
	Textile Piece Goods	256	45	(12)						
	Soft-Drink Bottling	40	15	0						
	Sweets & Confectionary	8	61	0	483	350	(17)	483	280	(17)
	Retreated Tires	15	0	0						
	Cooking Fat	25	20	(2)						
	Chemical Goods	11	13	0						
	Construction & Civil Engineering	46	30	0						
Grand Total					6,592	1,408	(184)	2,592	1,338	(184)

(Table-14)

Noshi Urban	P	1,233	69.1%
	C	552	30.9%
	T	(121)	
Rural Areas	P	1,359	63.4%
	C	786	36.6%
	T	(63)	
Total	P	2,592	66.0%
	C	1,338	34.0%
	T	(184)	

"p" stands for "Permanent"

"C" stands for "Casual"

"T" stands for "Technical"

Do You Have Any Other Sources of Income Besides Running the Industrial Unit? (Table-15)

Availability of resources	Kind of resources	Category of industries	Hai		Moshi		Rombo		Pare		Region	
			Yes	No	Urban	Rural	Yes	No	Yes	No	Yes	No
Crop- Based Ind.		Coffee Pulper	1	-	-	1	-	1	-	1	3	1
		Rice & Maize Mill	-	-	1	-	4	-	3	-	8	0
		Sugar	-	-	-	1	-	-	1	-	2	0
		Sisal	1	-	-	1	-	-	1	3	3	3
		Feeds	-	-	1	-	-	-	-	-	1	0
		Cotton Ginning	-	-	-	-	-	-	1	-	1	0
		Calabash Goods	-	-	-	-	-	1	-	-	0	1
		Lamp Shade	-	-	-	-	1	-	-	-	0	1
		Mosquito Coil	-	-	-	-	-	-	-	-	0	1
		Subtotal	2	0	2	3	1	5	1	6	4	18
Livestock- Based Ind.		Hide & Skin	-	-	-	-	-	1	-	-	-	1
		Leather Goods	-	-	1	1	-	1	-	-	1	3
		Subtotal	0	0	1	1	0	1	1	0	2	3
Forest- Based Ind.		Saw Mill	3	1	-	1	1	2	1	1	7	5
		Carpentry	6	1	-	-	1	2	1	2	10	3
		Plywood	-	-	-	1	-	-	-	-	0	1
		Furniture	-	-	1	4	-	-	-	-	1	4
		Vehicle Body	-	-	-	1	-	-	-	-	0	1
		Crate	-	-	-	1	-	-	-	-	0	1
		Subtotal	9	2	1	9	1	4	2	3	18	15
Clay & Mineral- Based Ind.		Gypsum	-	-	-	-	-	-	-	1	-	1
		Brick	2	-	-	-	-	4	-	1	-	7
		Pottery	1	-	-	-	-	-	1	-	2	0
		Gravel	-	-	-	-	-	1	0	-	-	1
		Subtotal	3	0	0	0	0	5	0	3	0	11

Industries Based on Local Resources



Availability of resources	Kind of resources	Category of industries	Hai		Moshi		Rombo		Pare		Region	
			Yes	No	Urban	Rural	Yes	No	Yes	No	Yes	No
Industries Based on Other than Local Resources		Tin & Black-smith	-	-	-	-	-	-	1	1	3	1
		Metal Working	1	-	-	-	1	-	1	-	3	3
		Engineering	-	-	-	-	-	-	-	-	0	2
		Auto Workshop	-	-	-	-	-	-	-	-	0	3
		Subtotal	1	0	0	0	1	3	2	1	6	9
		Bakery	1	-	-	-	-	0	1	3	4	2
		Tailoring	-	-	-	-	-	3	1	4	7	1
		Textile Piece Goods	-	-	-	-	-	-	-	-	0	4
		Soft Drink Bottling	-	-	-	-	-	-	-	-	0	1
		Sweets & Confectionary	-	-	-	-	-	-	-	-	0	1
		Retreated Tires	-	-	-	-	-	-	-	-	0	1
		Cooking Fat	-	-	-	-	-	-	-	-	0	1
		Chemical Goods	-	-	-	-	-	-	-	-	0	3
		Construction and Civil Engineering	-	-	-	-	-	-	-	-	0	2
		Subtotal	1	0	0	0	0	3	2	7	11	16
Total			16	2	4	32	4	5	21	6	66	50

## 4.2 Financing

As we have already noted, the Kilimanjaro Region receives little financing from major banks for equipment investment and its demand for working capital has been declining, although the present level is still relatively high.

Let us now discuss the financial demand of industries in Kilimanjaro on the basis of the data collected in our survey before treating the causes of the great gap between supply and demand in detail.

### (1) Financial Demand by Large and District-level Industries

#### (i) Demand for Equipment Investment

**Larger Industries:** As far as large or parastatal industries are concerned, their finances for equipment investment are completely and directly controlled by the central government, which requires that this problem be discussed in terms of nationwide fund allocation.

However, on the regional level there remains the question of why the Kilimanjaro Region has not received as much financing as Arusha and Tanga, which have the same market size as Kilimanjaro. The following explanation is plausible:

- (a) Since the Kilimanjaro Region is comparatively well off in terms of per-capita GRP, it has been allocated fewer funds than other regions in connection with the government policy of equalizing regional income levels through industrial allocation.
- (b) Kilimanjaro is greatly dependent on coffee and is relatively less endowed with industrial resources which can attract and induce large investment.

District Level Industries: The present discussion will be concentrated on district and village level industries.

According to our survey, district level industries do not have so many complaints about financing and do not need much financial assistance, whereas village industries have an acute need for financial support. The reasons why district industries are not very dependent on outside funds could be as follows:

- (a) Since they are fairly profitable, they can finance their equipment investment by themselves if necessary.
- (b) They are reluctant to expand their operations because raw materials and spare parts are not easily obtainable and the business atmosphere is not favourable.
- (c) Some industrialists belong to ethnic groups which traditionally have tended to depend on their own communities for financing.

(ii) Demand for Working Capital

Table 17 shows that parastatals account for 70-80% of the funds lent by NBC to manufacturing industries in the region, the rest going to private industries, mainly the Tanganyika Planting Company and district-level industries. An interesting fact is that although the private sector's share has been declining since 1974, the local industries' share has been gradually increasing, which means that district-level industries have been treated well by the Bank. This fact supports the conclusion of our survey that financing is not a very serious problem.

We may therefore make the following conclusions:

- (a) Financing does not represent a bottleneck in expansion of the activities of parastatals. If any problem does exist, it is a matter that concerns the central government and that is beyond the scope of our analysis.

(b) Financing does not seem to be a serious obstacle to the development of district-level industries either. The problem is nonfinancial constraints such as lack of technical skills, shortage of raw materials, difficulties in obtaining spare parts, lack of industrial linkage, etc.

This being the case, the chief financing problem of the region seems to lie with village industries. This is a problem that will be further discussed in the following section.

## (2) Financial Constraints on Village Industries

The problems of financing of village industries boils down to two main factors, namely, lack of credit standing on the part of borrowers and lack of credit extending capability on the part of banks.

### (i) Lack of Creditability

Generally speaking, credit standing or credit worthiness of borrowers is based on two factors: managerial capability and security or collateral. As far as management capability is concerned, it is a serious problem for village industries which will be fully discussed in the Section 4 of this chapter.

The problem of security, too, is a thorny one. Generally, security is in the form of real estate, i.e., land or buildings. But in Tanzania land has not been and is not expected to be a major form of security, partly because the marketability of land is very limited owing to a traditional land system which restricts transferability among different ethnical groups. The same thing, more or less, can be said of buildings.

Neither is machinery a good possibility for security because maintenance is inadequate. Therefore banks ask borrowers for guarantees by third parties, including public institutions like SIDO. However, since guaranteeing systems and practices have not been properly developed, borrowers have a hard time finding suitable guarantors.

(ii) Lack of Lending Capability

Financial institutions have recently placed an increasing emphasis on development of small industries and on diffusion of industries in rural areas. TRDB is particularly emphasizing this, and NBC, too, has been heavily involved in small industry development in terms of crop income mobilization and the hire purchase scheme through its subsidiary, the Karadha Company. SIDO, too, has established a special hire purchase scheme for the development of small industries. Then there is the special TIB fund for small industry development previously mentioned.

However, there are many problems to be solved before these funds and schemes can be satisfactorily utilized. Some of them can be attributed to the banks. At present only NBC has a network of branch offices, and even it does not fully cover the whole region because of over concentration in Moshi Town, as shown in Table 18.

TRDB has one branch in Moshi with only five staff members, three of whom are not permanent. SIDO also has a regional office, but its staff is extremely limited. Neither TIB nor the Karadha Company has any branches in the region, but NBC's Mawenji Branch in Moshi functions as an agent for the Karadha Company.

From this situation it may be seen that banks lack accessibility to potential borrowers commensurate with their responsibilities, which include not only lending but also project finding, project formulation, and technical and management guidance, which are even more crucial problems than lending in itself.

The final problem may be that of capability and efficiency of bank staffs, a problem which pertains to all economic activities in the country. Not enough time has passed since the Arusha Declaration to allow for adequate development of qualified manpower. The result has been difficulty in implementing many projects and schemes. It is our job to try to show how such difficulty can be overcome.

Financial Demand Survey by Industry Group (Table-16)

	National Level Industry		District Level Industry		Village Level Industry		
	Parastatal	Foreign Controlled	Total	Private Moshi	Cooperative Moshi Urban	Private Rural	Cooperative Rural
"Yes"	33%	100%	40%	18%	67%	88%	72%
"Yes"	3	1	4	4	2	14	33
"No"	67%	0%	60%	82%	33%	12%	28%
"No"	6	0	6	18	1	2	13
Total	100%	100%	100%	100%	100%	100%	100%
Total	9	1	10	22	3	25	46
						16	62

Source: Our own questionnaire survey.

"Yes" shows that there is financial problem, and vice verse.

NBC Lending for Manufacturing Industry in Kilimanjaro Region (Table-17)

	1973		1974		1975		1976	
	S	V	S	V	S	V	S	V
<b>Public Sector</b>								
Govt. community organization								
Parastatals	76.7	85.8	69.0	62.6	74.2	68.0	66.7	76.3
	7,850	7,695	8,900	8,877	12,500	7,688	13,000	10,544
Cooperative			0.2	6				
Ujamaa Village			0.4	52	0.2	33	0.3	43
				0.4		0.3		0.3
District development cooperation			0.4	50	0.3	36	0.4	64
				0.3		0.3		0.5
Subtotals	76.7	85.8	79.0	63.3	75.2	68.6	67.4	77.1
	7,850	7,695	9,008	8,475	12,583	7,754	13,143	10,643
<b>Private Sector</b>								
Local	13.4	14.1	14.5	11.3	12.8	16.0	14.6	18.4
	1,372	1,264	1,890	1,513	2,149	1,808	2,854	2,545
Foreign controlled	9.8	-	15.5	25.4	12.0	15.4	18.0	4.5
	1,000	-	2,000	3,381	2,000	1,739	3,500	623
Others	0.1	0.1						
	10	6						
Subtotals	23.3	14.2	30.0	36.7	24.8	31.4	32.6	22.9
	2,382	1,270	3,890	4,894	4,149	3,547	6,354	3,168
<b>Grand Total</b>								
	100	100	100	100	100	100	100	100
	10,232	8,965	12,898	13,369	16,732	11,301	19,497	13,811



NBC Lending by Branch in Kilimanjaro (Table-18)

	1973		1974		1975		1976	
Rombo	-	-	13	7	9	3	63	28
Same	4,522	2,244	6,444	3,933	7,926	3,671	722	560
Kibo	124,850	126,640	147,341	99,121	238,408	167,381	294,335	228,016
Boma	15,139	11,034	41,811	32,981	47,115	48,030	57,322	31,410
Mawenzi	1,404	961	3,814	2,913	3,078	2,528	3,248	2,142
Totals	145,915	146,879	199,423	138,955	296,587	221,613	355,690	262,156

#### 4.3 Production Equipment and Maintenance

The following analysis of production technology is by industrial classification: large or national industries, urban small and medium industries (district industries), and village industries. Assessment of level of production technology is made from both absolute level of present production equipment and the situation of machinery operation including maintenance and availability of spare parts.

##### (1) Large Industries

This category includes public and private large industries such as sisal and coffee estates, tanneries, wood working, etc. The main production lines of these industries are entirely equipped with imported machines. Some factories are run on two shifts. Production is satisfactory in the sense that product quality corresponds to production equipment.

##### (i) Maintenance System

According to our survey, the big problems are with maintenance and availability of spare parts, which lead to under-utilization of machinery and equipment. Some problems are:

- (a) Machinery and equipment cannot be operated due to lack of spare parts.
- (b) Spare parts are not durable because of poor materials.
- (c) Factories do not have enough manpower or facilities for proper maintenance.
- (d) There are no cooperative firms in the region which have the technological capability of providing maintenance service to larger industries.

These problems are not independent, but interrelated. Demand for spare parts is accelerated because of improper maintenance and poor material quality of spare parts.

For example, in one factory a gear was badly misformed, not because of ordinary use but because of unsuitability of the material of and use beyond the limit of endurance of the gear. In another factory a diesel truck broke down because a crank shaft bearing burned out owing to failure to provide engine lubrication oil regularly. In a third factory a machine motor broke down because a bearing was overheated because of improper repair of the motor on a previous occasion.

The main reasons for these breakdowns are failure to carry out periodical or daily checkups, inadequate repairing, and low material quality of some spare parts. Above all, regular maintenance is crucial. In large industries, the breakdown of one machine can have a considerable adverse effect on the operation other machinery. Therefore early detection of problems and early repair of machinery are important factors in sustaining the economic activity of large firms.

(ii) Self-contained Workshops

Although most large firms have their own workshops for maintenance and repair work, their equipment and facilities are very limited. Hence, they cannot cope with all requirements. Naturally, therefore, they seek the assistance of outside firms for maintenance and repairs. This suggests that the following improvements are needed:

- (a) A clear line should be drawn between inside orders and outside orders.
- (b) Outside orders should be placed only after preparation of drawings of spare parts and indication of material quality.

- (c) Time for manufacturing machine parts should be indicated in order to control the cost of outside orders.
- (d) Technological and checking standards should be set within the factory.
- (e) There should be planning of optimum stocks of spare parts for proper maintenance.

Such improvements will enable large factories to order spare parts from the outside to facilitate maintenance. They will also encourage the development of small industries.

## (2) Small and Medium Industries

As a representative small industry, let us analyze the metalworking industry. In Moshi Town there are many metalworking industries, consisting of the following classifications.

- (a) Car repair shops, which repair various vehicles and the main transportation facilities of the region.
- (b) Metal engineering shops, which manufacture parts and spares for motor vehicles and other ordinary machinery.
- (c) Metal processing shops, which fabricate window frames, stoves, etc.

The following analysis discusses the major problems with respect to production technology in these metalworking industries, which are expected to improve their production technology and thereby play a key role in the development of both large and village industries.

(i) Car Repair Shops

One of the major problems is that repair work is done on a haphazard basis, mainly because of lack of tools and measuring devices. Naturally, this results in unreliability with respect to the quality of repair work. Motor vehicle repair work should conform to automobile manufacturers' standards.

As the demand for car repairs increases, some test machinery will be needed for early detection of problems. However, since it is not economical to install such machinery in every repair shop, it is recommended that they be established in one specific place for common use. Besides, in the future the diesel engine will be encouraged because petroleum is a scarce resource for Tanzania, and as agriculture develops, mechanization will increase. In order to cope with this situation, additional facilities should be installed in these shops.

(ii) Metal Engineering Shops

Metal engineering shops in Moshi Town are very important in terms of repairing machinery and equipment and manufacturing parts and spares for both large industries and village industries. They will become even more so as maintenance engineering needs in related industries increase. Even now, however, they are not capable of meeting demand fully.

There are many reasons. One is the lack of common standards in engineering service among industries, particularly between large and small industries. Another is the lack of industrial specialization, which hampers technological development. This means that a wide range of materials have to be stocked in order to be able to meet many different types of orders, and this requires a lot of working capital and prevents workers from specializing and improving their skills.

The following divisions among industrial units will therefore be needed for technological improvement.

- foundry
- forging
- heat treatment
- welding and sheet metal processing
- surface treatment and painting
- press
- machine work

Needless to mention, before attaining such specialization, a definite technical standardization among industries is required. Also, this social division of labor will be a gradual process.

### (3) Village Industries

As representative industries in rural areas, we find sawmills, rice and posho mills and jaggery. The major problems in village industries are related to power supply: repairing motors in areas with electricity and repairing power generators in areas without electricity. These repairs have mainly been done by small industries in Moshi Town. When repairs are needed in villages far away from Moshi, the machines are transported to Moshi and brought back. Therefore, it takes time for repairs, and production meanwhile is stopped.

Steps should be taken before trouble occurs. One is proper maintenance. Regular supply or exchange of engine lubricating oil, cleaning of air cleaner, regular supply of oil to motors, and cleaning of motor brushes are examples of simple maintenance effective in minimizing machine troubles.

After setting maintenance standards for each industrial unit, regular inspection should be conducted for early detection of troubles. Parts and spares which are regularly needed for maintenance and repairing should also be properly stocked.

(4) Production Control and Planning

In addition to the above-mentioned maintenance system, a production control system covering the whole production process is needed for efficient operation of factory equipment. This will make possible quality control, production cost control, and production time planning. It will also make firms more competitive and viable through product specialization, quality improvement and standardization, shorter manufacture time, and lower production cost.

As previously mentioned, for further development of village industries production planning will be crucial. The following points are essential in this respect.

- (a) Production plans should take into account products types, production quantities, production capacities of different processes, delivery dealines, etc.
- (b) Regular maintenance in accordance with strict standards is needed for more rational and economical use of equipment.
- (c) Work standards and daily schedules should be set for all processes.
- (d) Product quality standards should be established, and application and durability clearly defined.

(5) Summary

The lack of adequate and regular maintenance systems is increasing the incidence of machine troubles and demand for spare parts. However, it is difficult to produce such spare parts locally because of lack of technical standardization among local industries. Those few parts produced are inferior in quality due to the utilization of poor production materials.

Accordingly, if maintenance and production control are properly undertaken, product quality and the production level of industries of the region will be greatly improved without investing much capital in additional equipment.



#### 4.4 Marketing Structure

##### (1) Marketing Channels

Marketing is crucial for the industrial development of the region. This is proven by our questionnaire, particularly as regards the establishment of new village industries. The following discussion of the marketing system is along the lines of the government's classification of industries: national industries, district industries, and village industries.

To begin with marketing area, for the most part the markets of village industries are the village (see Table 19), ward, district, or division in which the industry is to be found. On the average, 32% of the market is within the village. In the case of medium size, or district industries, employing 11-50 workers, the main market is shifting from the district to the region, i.e., the biggest marketing area of these industries is becoming the region. Another important feature of these industries is that many of their products are sold through private wholesalers to other regions, Mwanza and Dar es Salaam, for example. At the moment, small and medium urban industries are generally linked with a private marketing system.

As for the customers of small and medium industries, manufacturing industries are closely connected with individual clients; in other words, they sell their finished products directly to consumers. But the main reason seems to be that some industries monopolize distributors, and others are forced to sell directly to consumers owing to lack of adequate marketing channels.

This is the way small and medium industries, i.e., village and district industries, sell most of their products within the region. The problem is one of marketing. Although urban marketing systems are properly organized, rural marketing systems are extremely underdeveloped, and this causes industries difficulties in marketing their products.

## (2) Merchandising

The sole wholesaler at the regional level is the Kilimanjaro Regional Trading Company, but at present its purchases from local industries are limited to a few products such as soap, window frames, toilet paper holders, etc. In other words, the products of village and small industries do not go into RTC distribution channels. Nor are they sold through public distributors. Village and small industrialists are forced to look for customers on their own, such as private wholesalers or retailers of consumers.

However, this does not mean that RTC is reluctant to accept the products of small local and village industries. Far from it. RTC wants more marketable products, but most of the products brought to it are unfortunately not up to marketing standards, i.e., they are not suitable with respect to price, quality and quantity. Hence, in substance the problem is not one of marketing but one of production, and particularly production technology.

This does not mean that there is no problem with respect to marketing. For example, in order to avoid a pile-up of unsaleable stock, it is necessary to check adequacy of production machinery and equipment and to undertake market research to serve as a basis

for setting standards for production capacity, for village and small industries often have large stocks of unsold items which cause them financial hardships.

With adequate market research, these industries can, as far as their technical level allows, devise suitable product design, set realistic production targets, and set prices for their products at which they will sell well. Above all, product design is crucial. Recently, considerable stocks of unsaleable products have accumulated in village and small industries because of unattractive product design, even though there is a good potential market and competitors are enjoying good business.

Reorganization of marketing channels is therefore an urgent matter for village and small industries. These industries will have to direct their products more to the rural market. Linkage between such industries and traditional marketing systems like the rural open market and duka and linkage between these industries and cooperatives and RTC should be intensified. Above all, the role of RTC is vital. As it is a professional marketing organization with nationwide information on marketing, it should make an active effort to provide marketing information and know-how to village and small industries. For this purpose district RTC's should be enforced in terms of function and manpower.

Finally, a remark on the relationship between village industries and open air rural markets. The latter are distribution and marketing as well as social centres in the village and as such are very important to village life. Although in the past they chiefly handled minor agricultural crops, recently they have

begun to deal in manufactured goods as well. Thus, as a marketing outlet for village industries, the open air rural market will play a crucial for village industries, the open air rural market will play a crucial role in future development.

#### Industrial Marketing (Table 19)

Number of Industrial Units in Each Category of Scale of Employment That Market Their Products in Each Market Area Level

Number of Employed per Industry	Number of Employees			Total
	1-10	11-50	51 or more	
A. Market Area Level				
1. Villages	40	18	3	61
2. Wards	24	14	3	41
3. Divisions	22	13	3	38
4. Districts	21	14	3	38
5. Regions	14	24	11	49
6. Outside region	4	9	5	18
7. Outside country	1	2	3	6
Total	126	94	31	251
B. Buyers				
1. Individual clients	-	-	11	11
2. Traders	11	12	7	30
3. Government	-	3	-	3
Total	11	15	18	122

(3) KRTC and Industrial Market in Kilimanjaro

The Kilimanjaro Regional Trading Company accounts for about 85% of the total manufactured goods market in the region, and the purchasing power of the region ranks high in comparison with other regions because of coffee cash earnings.

Sales Levels of Different RTC's, 1974/75-1975/76 (Table 20)

(unit:1,000 shs.)

July 1974 - June 1975			July 1975 - June 1976		
RTC	Sales	(%)	RTC	Sales	(%)
Dar es Salaam	147,433	20.2	Dar es Salaam	131,358	12.4
Tanga	72,731	9.9	Tanga	92,070	8.7
Mwanza	60,304	8.2	Kilimanjaro	89,414	8.4
Arusha	49,306	6.7	Mwanza	89,277	8.4
Kilimanjaro	48,410	6.6	Arusha	74,141	7.0
Mbeya	40,091	5.5	Mbeya	55,640	5.2
Subtotal	418,275	57.1		531,900	50.1
National total 731,303 100.0			1,060,115 100.0		

Half of total demand in the region is for production goods supplied by BHESCO and AISCO. However, what should be stressed here is that although the Kilimanjaro Region enjoys a large market as mentioned above, the proportion of local supply in it is relatively low. In other words, in terms of market demand, the region has considerable potential for further industrial development in both production and consumer goods. At the moment, however, the only major item of local supply through the KRTC is match boxes produced by Kibo Match Corporation.

KRTC Sales Targets\*, 1974-77 (Table 21)

(unit:1,000 shs.)

	1974/75		1975/76		1976/77	
	Value	(%)	Value	(%)	Value	(%)
BHESCO	12,048	29.4	16,808	29.7	22,294	29.6
AISCO	6,876	16.8	9,331	16.5	15,423	20.4
DABCO	4,386	10.7	4,506	7.9	8,345	11.0
House Supply Company	9,692	23.7	10,346	1.8	14,150	18.8
NAPCO	120	0.3	1,200	2.1	800	1.0
General Food Company	7,837	19.1	14,334	25.3	14,277	18.9
Total	40,959	100.0	56,525	100.0	75,289	100.0

\* These targets were for the most part achieved.

#### 4.5 Industrial Linkage

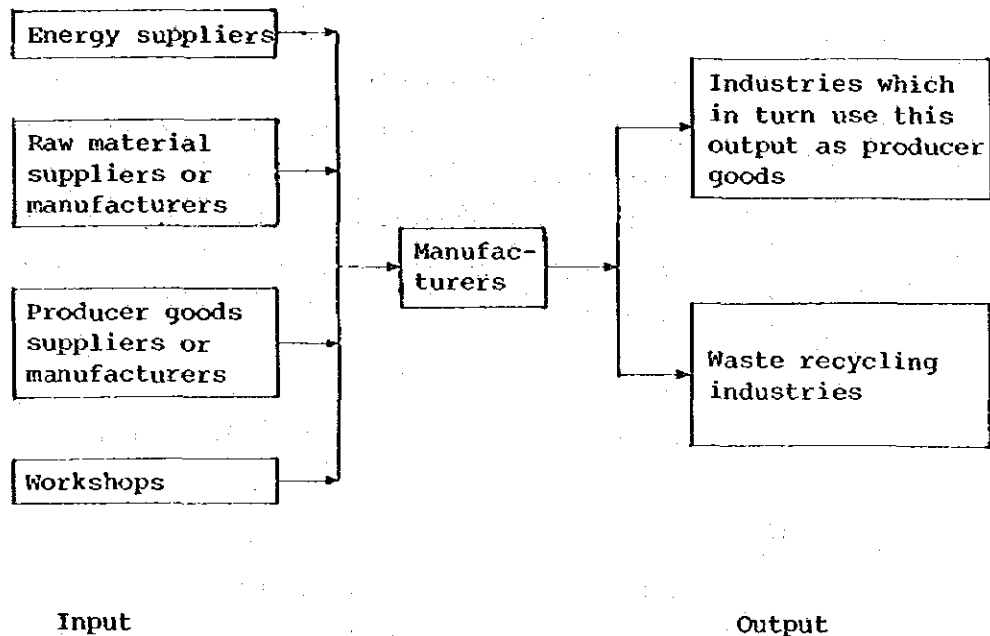
##### (1) The Importance and Types of Industrial Linkage

Industrial linkage is relevant to industrial development in many ways, and the reason why it should be emphasized in connection with the industrial development of the Kilimanjaro Region is that the industrial sector of the region is characterized by a triple structure in the sense that there is little linkage between larger industries, modern small industries, and village industries.

Generally, the potential advantages which can be derived from intensification of industrial linkage are far-reaching and include encouragement of division of labor, the raising productivity, the upgrading of skills, stabilization of markets, regular procurement of input materials, avoidance of duplication of investment, and efficient use of limited resources.

Actually, the industrial development of advanced countries has been accelerated by strengthening industrial linkage through industrial complexes, subcontractor industries, etc. The basic scheme of industrial linkage is shown in Fig.-4. The intensification of industrial linkage is essential for the development of industry in the region and unification of its industrial structure.

Basic Scheme of Industrial Linkage (Fig.-4)



The following are four types of industrial linkage based on the respective sizes of the industries linked.

(i) Large Industries--Larger Industries

This is industrial linkage between larger industries, the one as an input supplier and the other as a customer.

The main factor of such linkage is generally reduction of transportation cost through close location to one another or through the use of pipelines or conveyors. The typical case of such linkage is the petroleum complex.

(ii) Smaller Industries--Larger Industries

In this case, smaller industries are input suppliers for larger industries. This kind of linkage can be observed



between electrical product firms and motor vehicle manufacturers, the larger industries reducing their production cost by relying for their manufacturing of spare parts on smaller industries as subcontractors. The advantage is specialization on different scales and such an arrangement requires the establishment of a system of technical standardization between the two in order to maintain a definite quality of products, and this in turn necessitates that the large industries afford the smaller industries technical guidance.

In the Kilimanjaro Region this kind of linkage is suitable for coffee, tomato, and jam processing.

(iii) Larger Industries--Smaller Industries

This type of linkage is to be observed in the case of large and integrated industries like spinning, iron and steel, etc. Smaller industries, including garment factories, forging factories, and repair shops, will gather around such larger industries as users of their products. In this case, the relationship between the two is principally that of trading partners.

Examples of this pattern in the region are the linkage between tanneries and leather factories and between sawmills and woodworking factories.

(iv) Smaller Industries--Smaller Industries

In this case, smaller industries will attempt to specialize and cooperate among themselves to a certain extent for effective utilization of their equipment and upgrading of skills.

An example of this type of linkage in metalworking is specialization in forging, foundry, heat treatment, welding, and so on. In Japan, for example, cutlery goods are produced

in villages by means of this type of specialization among household industries. One household industry will specialize in press processing, another in hardening, another in grinding, another in polishing, and still another in assembling all the parts.

This type of linkage is effective for improvement of skills and techniques and for controlling inventories of raw materials and minimizing operational capital requirements. It does however require geographical concentration.

## (2) Industrial Linkage in the Kilimanjaro Region

The present situation of industrial linkage in the region is described in the following.

### (i) Smaller Industries--Larger Industries

As large firms in the region, East Africa Kenaf Industries, Tanzania Tanneries, Tanzania Bag Corporation, Moshi Plywood, Tanganyika Planting Company and Kibo Match Corporation are representative. Most of which have their own large workshops for maintenance and repair of their facilities. However, as these workshops cover a wide range of repairing services specialization and upgrading are difficult, and as a consequence they do not operate very efficiently.

None of these large firms rely on small industries for raw materials, producer goods or maintenance and repairs.

### (ii) Larger Industries--Smaller Industries

As smaller industries in this category, leather and bag makers and furniture producers depend, respectively, on large-scale tanneries and sawmills. The development of these industries depend greatly on product design or mechanizing, making linkage with information suppliers which can undertake design development and market survey essential.

(iii) Smaller Industries--Smaller Industries

There are two common types in this category: linkage between village and town industries and linkage between town industries. An example of the former is village sawmills and rice mills depending on town repair shops for repairs and maintenance and an example of the latter is linkage between different car repair shops in town with respect to activities such as metal cutting, padding, metal polishing, motor overhauling, and recycling of junked vehicles all of which each individual repair shops cannot manage to cover.

(iv) Linkage Between Different Sectors

In the Kilimanjaro Region the most important linkage between different sectors is with respect to such local resources as crops, livestock, and minerals and clays.

(a) Crop Processing

At the present most crops are sent to other regions, mainly Arusha, without secondary processing, chiefly because not enough crops are grown to justify the scale of processing facilities required for efficient operations. As crop production levels rise in the future, some such processing industries should be encouraged. The most likely areas in this respect are vegetables, fruits, wheat, cotton, and pyrethrum.

(b) Livestock Products:

Livestock, too, are sent out to Arusha for processing. With an increase in livestock production, new development of dairy and meat processing industries can be expected.

(c) Minerals and Clays:

At present there is little industrial linkage with mineral production in spite of identification of deposits. This is presumably mainly due to the fact that the region faces disadvantages in mineral processing industries requiring a lot of fuel because of its location far inland. As a result, there have not yet been adequate surveys of mineral deposits.

In the case of gem stones, however, linked industries will be possible in the near future once deposits are identified.

Although adequate surveys have not yet been conducted with respect to clays, it should also be possible to fabricate brick and clay piping even with low quality materials.

(3) Obstacles to Industrial Linkage

As previously mentioned, the industrial linkage of the region is so limited that the region can be considered to have a "triple industrial structure." Particularly important for industrial development of the region is linkage between larger industries and smaller or village industries.

The major obstacles to such linkage can be summarized as follows:

(i) On the Larger Industries Side

- (a) As there is no definite technical standardization in larger industries, it is difficult to place orders with small outside industries

(b) Inadequate control of material purchases and of placing of orders makes it impossible to assess the cost of placing orders outside.

(c) There is a general lack of confidence in the quality of work of smaller industries.

(ii) On the Smaller Industries Side

(a) Very limited capacity to accept orders from outside because of lack of processing facilities such as foundries, forges and presses.

(b) Low level of technology because of lack of specialization in processing activities.

(c) Incapability of determining the price/cost and delivery schedule of products because of improper management techniques.

The same obstacles exist in respect to development of linkage between smaller industries.

(4) Conclusion

In order to encourage overall industrial development, the intensification of industrial linkage is essential and even urgent.

In the Kilimanjaro Region there are considerable possibilities for increasing industrial linkage, particularly with respect to maintenance service, printing, box making, etc., in connection with existing larger industries.

Also, in the future linkage between village/cottage industries in such fields as ceramics and cutlery will become increasingly significant for rural development.

The following improvements will however be essential:

- (a) Improvement of production technology on both sides
- (b) Improvement of management technology on both sides
- (c) New establishment of basic processing facilities in smaller industries.

## 5 PROBLEMS IN INDUSTRIAL STRUCTURE

The industrial development of the Kilimanjaro Region is hindered by many problems on the national, regional, district and intra-firm levels as already discussed. Based on these analyses, the present chapter will attempt to present the basic structure of these problems.

### 5.1 Regional Setting

- (1) Physical constraints: The region faces an arable land shortage, particularly in the highlands.
- (2) Coffee dependence: The economic structure is lopsided and vulnerable in that it depends on coffee, the major export and cash crop.
- (3) Instability: A coffee economy has meant a tendency toward slumps and booms.
- (4) Structural stagnation: Even though the economy sometimes experiences a sudden boom or prosperity, in terms of structure the economy is basically in a chronically stagnant situation which leads to shortages of employment opportunities and underemployment.
- (5) Lack of investment opportunities: Since there are few investment opportunities, the greater part of income earned from coffee exports has remained unproductive. In other words, coffee earnings are not efficiently utilized in investment opportunities outside coffee production because there are few such opportunities in the region and as a result, investment funds are flowing out of the region.

## 5.2 Sectoral Setting

- (1) **Unintegrated industrial structure:** The unbalanced economic structure also greatly affects the industrial structure, which consists of three practically separate parts (hence the description "triple structure"): parastatal industries, small and medium urban industries, and village industries. Lack of linkage between these parts hampers overall development of the industrial sector.

Lack of development in the industrial sector is also evident in terms of size and kinds of industries, there being few medium-size industries to bridge the gap between large and small industries. In terms of kinds of industry, there are producer or consumer durable goods industries to bridge the gap between resource-based and simple consumer goods industries.

- (2) **Vulnerability of village industries:** For future industrial development, the most crucial point is the weak position of village industries, which are vital for future self-sustained growth (especially as run by cooperatives). It is obvious that this category of industry should be encouraged considering the need for it to assume a pivotal role in the future industrial development of the region. However, this can be achieved only by upgrading the technical level of these industries in order to link them with other categories of industries like urban industries and parastatal industries. As a result, this will lead to the dissolution of the unintegrated or triple industrial structure and eventually will establish the basis of an industrial complex essential for the future industrial development of the region.



### 5.3 Intra-firm Level

The present problem is factors impeding the development of industries at the intra-firm level, particularly village industries.

As shown in Table 22, our survey has clarified this question. The financial problem is the most serious and ranks first (30.2% of total replies), technical constraints second (29.2%), and marketing problems third (24.0%). These three problems were cited by nearly 84% of respondents.

At the same time, according to the "Expectations Survey," industrialists hope for government remedies of these problems. Consulting services and repair services would alleviate technical problems, and the marketing problem would be alleviated by a sharing of common facilities.

However, upon scrutinization of these problems, it is clear that the basic cause of the top three problems is largely technological. A low level of technology leads to low quality of products and machine troubles, which further cause financial hardships and marketing difficulties. In other words, if the technological level is improved, the situation will be brighten. Technological development through institutions is essential.

With improvement of technology in small and village industries so that they can stand on their own feet, the process of self-sustaining growth in the industrial sector will be set in motion, and structural changes, too, will be induced.

Problems and Expectations (Table-22)

	Question	Moshi					Number	%
		Hai	Urban	Rural	Rombo	Pare		
Problems	1 Financial Problems	11	11	2	17	17	56	30.2
	2 Technical Problems	13	13	6	10	14	56	29.2
	3 Marketing Problems	13	9	4	8	12	46	24.0
	4 Utility Problems	10	2	33	5	12	32	16.7
Expectations	1 Common Facilities	13	14	1	16	20	64	28.4
	2 Repair Services	11	3	1	6	4	25	11.1
	3 Training centre Services	12	4	1	7	12	36	16
	4 Consulting Services	11	6	1	7	15	40	17.8
	5 Financial Assistance	11	11	4	17	17	60	26.7