

## 6. OBJECTIVES

Generally, regional objectives can be derived and translated from objectives at the national level and overall development objectives and strategies of the region. National objectives for industrial development are not always duplicated in the regional objectives for industrial development.

As the major objectives of industrial development, the following can be cited:

- (i) To increase industrial income
- (ii) To generate more employment opportunities
- (iii) To advance the level of basic industries through structural change
- (iv) To increase the equality of income distribution

As mentioned previously, the most serious issue in the region is a decreasing opportunity for additional income creation due to the vulnerable crop pattern and land shortage. Therefore, we have to look for supplementary income opportunities in other sectors than agriculture. For this purpose, the industrial sector is most promising. Industrial development can provide village people with additional income which supplements low agriculture income if established in rural areas, particularly in the highlands. Furthermore, even if established in urban areas, industries can provide new income opportunities to job-seekers who come from the highlands.

The importance of industrial development in the region is not limited to supplementary income opportunities but also extends to creation of employment opportunities especially for underemployed people. There is much unemployment in

the highlands of both the explicit and disguised natures involving people who cannot find suitable work in the agriculture sector. Accordingly, efforts to absorb more people should be made in industrial development, and an attempt should be made to avoid concentrating new income opportunities among certain groups which already enjoy adequate income. It is vital that the effects of any new employment be maximized among the unemployed.

In the Third Five-year Plan the government, too, is stressing the fostering of basic industries through structural change. According to it, the characteristic feature of Tanzanian industries is concentration, along colonial lines on export industries based on specific "cash crops" and on simple consumer goods which do not necessarily meet local needs satisfactorily. Therefore, future industrial development in Tanzania should be subject to and should be directed to basic industries, viz., producer goods industries, including intermediate goods industries and capital goods industries, and basic consumer goods industries which meet local demand. The former includes glass, cement, chemicals, ceramics and so forth, and the latter, food processing, clothing, footwear, etc.

In the context of regional industrial planning, it is essential to comply with government objectives. Especially when compared with the industrial structures of the Tanga and Arusha regions, that of Kilimanjaro is somewhat backward in terms of industrial composition. To put it another way, the industries of the Kilimanjaro Region consist mainly of resource-oriented industries and simple consumer goods industries, with very few intermediate goods industries and capital goods industries, which are essential for future industrial development. Another vulnerability of the region is lack of medium-size industries, which are a bridge between small industries and larger industries.

This means that the region lacks one dynamic factor for future industrial development. Because of this, future emphasis should be placed on the development of basic industries aiming at a structural change in the region.

The fourth objective is income equality. Especially critical is the gap in income between Pare and the rest of the region. Even allowing for some statistical error, there is a great gap between these two areas. Of course, the income gap is not limited to these two areas but rather extends also to the intra-district level. When agriculture cannot effectively mitigate such a gap, industrial development utilizing local materials can narrow income disparity.

## 7. TARGETS : PROJECTIONS

### 7.1 Introduction

The macroprojection of employment in the manufacturing sector calls for approximately 12,300 employees in 1975, and 16,400 in 1980. This projection is based on the assumption that employment will increase at the rate of 6 per cent per annum between 1975 and 1980. These projected figures seem at first to be at wide variance with the results of our field survey, on the basis of which our field survey, on the basis of which total employment in 1976 has been projected at 8,385. However, when we take into consideration the fact that our field survey could not cover all the existing industrial units of the region--it can be assumed that coverage was only about 70 per cent in terms of number of employees--employment in the manufacturing sector in 1976 could very well come to approximately 1,200, or near the macroprojection. This discrepancy can be explained by the fairly large number of people self-employed, whom were not included in our field survey.

In our present employment projection we have adjusted the employment figures for the purpose of practical planning in such a way that they include only purely industrial employees, excluding, for example, estate workers in the fields. (The adjustment method and the calculations themselves are discussed in detail elsewhere as well as in the following section.) We also confined our projection, as much as possible, to medium-to small-scale industries, or, in other words, district and village industries, excluding large-scale and national industries, which are primarily coordinated by national authorities.

The following two projections of "Industrial Units and Investment Requirements" and "Industrial Output" also deal primarily with medium- and small-scale industries.

## 7.2 Employment Projection

Our field survey, although its coverage is not 100 percent, makes it possible to estimate the number of employees in the industrial sector in the Kilimanjaro Region. The industrial population has already been given; it is reproduced here as data for projection. The figures were adjusted somewhat by excluding any numbers that were questionable or vague and also by estimating the rate of coverage in each district. The method employed in projecting the employment growth rate is very simply. An annual growth rate of 6 per cent is assumed for 1967-1975.

From the viewpoint of the projected macroframe, 8.2% and 9.6% growth in manufacturing employment are expected for 1975-1980 and 1980-1985, respectively, considering increase of productivity. In spite of a high growth projection for the manufacturing sector, its share of total employment will be only 5.5% in 1980 and 7.1% in 1985 as compared to 4.4% in 1975. It will be very hard to realize this growth without the considerable concrete measures for promotion of industry that we have already discussed.

There should be concern about heavier concentration of industrial employment in urban Moshi. Such concentration is based on migration from villages and results in the urban unemployment and slum problems notoriously common to big cities in developing countries. Nevertheless, we feel that geographical distribution of industries should come after development of fundamental industrial infrastructure along with necessary physical infrastructural facilities and the establishment of basic industries. This, in turn, implies that a certain centralization of industrial activities is inevitable, particularly in the early stages of industrial development.

### 7.3 Industrial Units and Investment Requirements Projection

In an attempt to project the acceptable number of new and expanded industrial units and their investment requirements over the coming five years, various assumptions are made hereunder. These assumptions are mostly based on a variety of information collected during the course of our planning activities in the Industrial Development Programmes.

#### (1) Assumptions of the Projection

To begin with, for new industrial projects the following two assumptions are made:

- (i) An average initial investment of Shs.120,000/- per unit

This figure is based on both the compilation of existing industries and the calculation of new industrial projects which are indicated in great detail in the last chapter of this plan. In spite of the fact that the previous estimate was Shs.200,000/-, the present figure is far lower. This may be due to some difference in the respective approaches to choosing appropriate projects. Ours is more heavily biased toward utilization of local resources.

- (ii) An average of 9 employees per unit.

This assumption is partly based on our findings in the field survey, which prove that the region faces a problem of distributive polarization between a few large industries and many small industries. This number of employees is the minimum figure which an average project requires. In other words, there is always the possibility of increasing the number, whenever the project can afford to do so.

For the expansion of existing industries, the following assumptions are made:

- (iii) An average additional capital investment per unit of Shs.70,000/-.

The reason why the figure is lower by Shs.50,000/- than the average initial investment is that existing industries already have premises and infrastructural facilities.

- (iv) An average of 6 additional employees per unit.

Additional employment capacity of expanding industries is expected to be 6 employees per unit as opposed to 9 employees per unit in the case of new industries.

- (v) The number of new and expanding industrial units to receive project loans and grants is as follows: (Table 23)

	1976/77	77/78	78/79	79/80	80/81	81/82
New Indus. Units	-	5	15	15	25	25
(Producer-Cooperatives)	-	3	7	7	12	12
Expanding Indus. Units	-	10	20	20	25	30
(Producer-Cooperatives)		5	10	10	15	20

For the purpose of supplying short-term loans to both expanding and new units, the following projections are added:

- (vi) The present number of existing industrial units is 162.

This number is based on our field survey. Distribution of industrial units by district is as shown hereunder. (Table 24)

	Hai	Moshi		Rombo	Pare	Total
		Urban	Rural			
Number of Units Surveyed	18	39	10	27	26	120
Coverage (%)	75	70	65	80	80	-
Estimated No. of Units	24	56	15	34	33	162

(vii) The average number of employees per existing unit is 27.

This figure, too, has been obtained from our field survey. In fact, it is the figure obtained by dividing the total industrial population, 4427, by the total number at industrial units, 162. Incidentally, approximately the same figure can be obtained by dividing the adjusted population, 3194, by the surveyed number of industrial units, 120.

(viii) The average working capital loan requirement per existing (non-expanding) unit is Shs.9,000/-

This figure is one half the amount assumed for new and expanding industrial units.

(ix) These industrial units are to receive working capital loans twice a year.

(x) Among the non-expanding existing units, the following percentages are to receive working capital loans over the five years between 1977/78 and 1981/82: 10 per cent in 1977/78, 20 per cent in 1978/79, 30 per cent in 1979/80, 40 per cent in 1980/81 and 80 per cent in 1981/82.



(xi) The average working capital loan is Shs.18,000/-

The figure, too, is derived from the data compiled in the last chapter. It is approximately equivalent to 1.5 months' working capital requirements.

(xii) All of the new and expanding industrial units will receive working capital loans.

And finally, for all the non-expanding, expanding, and new industrial units, we assume that:

(xiii) All working loans are to be repaid within one year.

## (2) Specific Targets

The projections for new industrial establishments and expansion of existing industrial units, for long-term and short-term loan requirements, and for government funds for subsidizing producer cooperatives in the industrial sector of the region are all based on the above assumptions.

In Table 26 projected estimates of long-term loan requirements are shown. For 1977/78 the total required investment is estimated at Shs.17.9 million, which is not very ambitious by any standard. When we assume that 75 per cent of the total investment required is to be financed through financial institutions, the total amount of loans required for such investment will amount to Shs.13,425 million. In Table 27 projected estimates of short-term loan requirements are given. Working capital requirements for non-expanding industries and expanding and new industries are calculated in Items (6) and (9), respectively, as all the loans are supposed to be repaid within one year, and the real loan requirements are seen in Items (7)

and (10). The total short-term loan requirement is therefore Shs.1,368,000/-. Finally, Table 28 is the projection of government grant (subsidy) requirements for producer-cooperatives. The number of cooperatives to be newly introduced and to be expanded is already cited in Assumption 5 above. Here we additionally assume that government subsidies for fixed capital investment will not exceed 25 per cent of total fixed capital investment. A total of Shs.2,367,500/- is to be granted to producer-cooperatives as subsidies over a five-year period. Since the regional development budget for the industrial sector and the regional development funds from the Prime Minister's Office allocated to the Kilimanjaro Region were approximately Shs.1.8 million in 1975/76, this figure can be regarded as very manageable.

Fundamental Elements in "Assumptions" (Shs.) (Table-25)

	Fixed Capital per Unit	Working Capital per Unit	Ave. Employ't per Unit	No. of indus- trial Units
New Industry Units	120,000	18,000	9 (Minimum Employment)	85 (41 Coops by 1981/82)
Expanding Industry	70,000	18,000	6 (Additional Employment)	105 (60 Coops)
Non- Expanding Industry	-	9,000	-	-

Estimates of Long-term Loan Requirements (Table-26)

	1976/77	1977/78	1978/79	1979/80	1980/81	1981/82	Total
1. Number of New Industrial Units	5	15	15	15	25	25	85
2. Investment for New Industrial Units (1) x shs.120,000	600,000	1,800,000	1,800,000	1,800,000	3,000,000	3,000,000	10,200,000
3. Number of Expanding Units	10	20	25	25	25	30	110
4. Investment for Expanding Units (3) x shs.70,000	700,000	1,400,000	1,750,000	1,750,000	1,750,000	2,100,000	7,700,000
5. Total Investment (2) + (4)	1,300,000	3,200,000	3,200,000	3,550,000	4,750,000	5,100,000	17,900,000
6. Loans Required for Total Investment (5) x 75%	975,000	2,400,000	2,400,000	2,662,500	3,562,500	3,825,000	13,425,000

Estimates of Short-term Loan Requirements (Table-27)

	1976/77	1977/78	1978/79	1979/80	1980/81	1981/82	Total
1. Number of Existing Industrial Units	162						
2. Number of Expanding Units	10	20	25	25	25	30	
3. Number of Non-Expanding Units (1) - (2)	152	132	107	107	82	52	
4. Percentage of Non-Expanding Units which Require Working Capital Loan	10%	20%	30%	30%	40%	80%	
5. Number of Non-Expanding Units which Require Working Capital Loan (3) x (4)	15	26	32	32	33	42	
6. Working Capital Loan Requirements (5) x shs.9,000/-	135,000	234,000	288,000	288,000	297,000	378,000	
7. Yearly Increase in Additional Loan Requirements		135,000	99,000	54,000	9,000	81,000	378,000
8. Number of New and Expanding Units	15	35	40	40	50	55	
9. Working Capital Loan Requirements (8) x shs.18,000/-	270,000	630,000	720,000	720,000	900,000	990,000	
10. Yearly Increase in Additional Loan Requirements		270,000	360,000	90,000	180,000	90,000	990,000
11. Total of Yearly Increase in Additional Loan Requirements (7) + (10)		405,000	459,000	144,000	189,000	171,000	1,368,000

Estimates of Subsidy Requirements for Producer-cooperatives (Table-28)

	1976/77	1977/78	1978/79	1979/80	1980/81	1981/82	Total
1. Number of New Producer-Cooperatives	3	7	7	7	12	12	41
2. Investment for New Producer-Cooperatives (1) x shs.120,000	360,000	840,000	840,000	840,000	1,440,000	1,440,000	4,920,000
3. Subsidies to New Producer-Cooperatives (2) x 25%	90,000	210,000	210,000	210,000	360,000	360,000	1,230,000
4. Number of Expanding Producer-Cooperatives	5	10	15	15	15	20	65
5. Investment for Expanding Producer-Cooperatives (4) x shs.70,000	350,000	700,000	700,000	1,050,000	1,050,000	1,400,000	4,550,000
6. Subsidies to Expanding Producer-Cooperatives (5) x 25%	87,500	175,000	175,000	262,500	262,500	350,000	1,137,500
7. Total Subsidies (3) + (6)	177,500	385,000	385,000	472,500	622,500	710,000	2,367,500

## 8. STRATEGY FOR INDUSTRIAL SECTOR

### 8.1 Background

The following strategies can be regarded as the methods for achieving the above-mentioned objectives and should be the most effective approach in overcoming the constraints existing in the region.

Before going into a detailed explanation of each strategy, some fundamental problems should be mentioned here.

- (1) The first problem is the matter of who should take the key role in the strategies and the way the strategies should be carried out.

The official answer to this question has already been given in the historical background of regional integrated planning. The major milestones are the Arusha Declaration, 1967, and the Decentralization Policy, 1972. In summary, they prescribe that the Tanzanian people should pursue strategies within the framework of Tanzanian socialism and self-reliance. The Decentralization policy, in particular, has stressed that planning and control of development must be exercised more at the local level. The important point is the people's aspirations at the local level, instead of the conventional top-to-bottom approach.

- (2) Of course, we do not mean in saying "by Tanzanian people and within the framework of Tanzanian socialism" that foreign assistance and incentives are forbidden. This matter is already well defined by the Arusha Declaration and other Presidential Speeches.

- (3) Although, as mentioned above, these strategies should be based on Tanzanian socialism, that does not mean that efficiency, motivation, technological improvement, and increase of productivity should not be emphasized more than ever. Rather, they are all simultaneous aims and thereby strengthen economic viability and competition and lead to self-reliance and economic stability and growth.
- (4) The major tasks which the Kilimanjaro Region faces and which industrial planning should tackle are the creation of more possibilities for economic growth and the reduction of economic vulnerability by restructuring the "monoculture" type of economy. However, a structural change of the economy is no easy matter. Hence, we do not assume that the objectives will be achieved completed during the period of the plan, but rather, we are trying to after past tendencies which were inherent in the economy, to eliminate stagnation, and to establish fundamental conditions for self-sustained and steady growth, the threshold of which will be crossed at the beginning of the Fourth Five-Year Plan.



## 8.2 Strategies

Eight strategies are presented here. These strategies can be roughly divided into two groups. Some of them are mainly related to removing the existing severe constraints of the industrial sector, and others are directly oriented to paving the way to future industrial development.

### (1) Strategy-1

Maximum utilization of existing production capacity of the industries of the region: The rate of utilization of plant capacity is presently very low. In factories there are many machines which are under-utilized. Causes are varied, such as nonavailability of raw materials, difficulties of obtaining spare parts, difficulties in finding markets, etc. Among them, the problems of raw materials, spare parts, and machine trouble are typical. Improper maintenance has aggravated the situation.

Needless to say, if these difficulties can be overcome, production and employment will develop more easily than by simply installing more machinery. We have to tackle the problem from many angles: introduction of a technical guidance system, intensification of the maintenance system, and promotion of metal and engineering industries.

### (2) Strategy-2

Full utilization of locally available resources, including recycling of waste resources: The Kilimanjaro region has many natural resources, including gypsum, magnesite, commercial crops like vegetables and fruits, forestry products, and livestock. Although many impediments exist, new industrial units should emphasize these resources as much as possible.

Recycling is also important. Some resources that at present are thrown away can be put to use. Sawdust, lubrication oil, and scrap metal from broken vehicles are good examples. Another aspect of recycling is the reutilization and reworking of problem parts and even machines themselves, which industrial workshops usually scrap. If they can be worked over or transformed in minor ways, they can still be used for production purposes. We have proposed many new industrial projects below to be based on these at present unutilized resources.

The effects of this strategy will be far-reaching. The first is creation of income and employment opportunities via new industries based on these local resources. Another utilization of local resources can lessen imports, and some new industries may be able to export their products overseas due to the natural advantage of local resources.

(3) Strategy-3

Preparing foundation of basic industries which meet the essential needs for development of the region:

The basic industries should be given first priority since, as the Third-Five Year Plan stressed, they have the biggest strategic role and largest overall effect on industrial development. However, it is not easy for the Kilimanjaro Region to have ordinary basic industries like metals and chemicals at the present level of development because these industries require considerable technology and efficiency compared with the present primary products-based industries and simple consumer goods industries. Therefore our plan calls not for the introduction of basic industries but rather the preparation of a foundation for basic

industries by introducing and improving foundries, forges, metal processing and the ceramics industry. Moreover, these introductory industries can provide spare parts, construction materials, and agricultural implements, the shortages of which are critical at present.

(4) Strategy-4

Encouraging industrial linkage between existing industries and with other sectors of the economy:

This strategy is crucial to future industrialization. Unfortunately, most larger industries of the country are self-contained and have little linkage effect, both forward and backward, on the local economy. There are two historical reasons for this. One is that former colonial companies were oriented toward other countries rather than the local economy. Even now larger or national industries are not linked with smaller local industries because the former cannot rely on the latter due to the difference in technological level.

The effects of industrial linkage on development are potentially tremendous. Larger industries are potential purchasers of raw materials and spare parts from smaller industries and potential suppliers of intermediate goods to small industries. In addition, they can be big employers and consumers in the local economy. However, these effects are merely potential at the present stage.

Linkage effects are not limited to the industrial sector but extend also to other sectors such as agriculture and tourism. Agro-industries are influential in overall development of the region. Some industries

can be developed on the basis of agricultural crops, and others as suppliers to the agriculture sector, such as agricultural implement industries. These industries should be greater stressed in the context of rural development.

In connection with linkage effects, we lay great emphasis on improvement of engineering activities of smaller industries, particularly in term of technology, as a means of catching up with larger industries. As a result, in the near future, larger industries which are at present equipped with their own big workshops should rely on spare parts from smaller industries. In this way, smaller repair shops will be able to expand their business by receiving technical know-how and a fixed market from larger industries. At the same time, larger industries can also gain much in that their own business can become specialized by handing spare parts making over to smaller industries. Thus, they also secure a nearby supplier rather than one in another region or overseas, and they can conduct regular and periodical maintenance by receiving constant service from smaller engineering factories. In this way, both have much to gain from each other. Eventually, the triple industrial structure which is composed of large industries, small urban industries, and village industries and is a present characteristic of Kilimanjaro industries will be dissolved in evolution to industrial integration and industrial complexity.

(5) Strategy-5

Properly allocating industries in the region, including the establishment of fundamental conditions for development of village industries

Considering that Tanzanian socialism places emphasis on increased equality of income distribution, it is vital to reduce gaps in income and employment opportunities by proper allocation of industries. Generally, industrial location is determined by resource availability, physical infrastructure, market accessibility, and external economies. Hence, even though the per-capita income level may be low, with a dense population the situation is not so serious if natural resources and infrastructural facilities are readily available. The most serious situation is a low income area with no resources to speak of and no social overhead capital. In such a case, it is not easy to raise the income level through deliberate industrial allocation in a short time span. However, as a matter of course, these factors are variable and flexible if considered over the long run. Since at present low income areas are generally not endowed with infrastructure facilities, industrial allocation to this area should be accompanied by infrastructure development and manpower improvement.

This holds even truer in the case of village industries development. It is essential to raise income levels and to change means of livelihood in rural areas from simple economic activities such as those of a monoculture cash crop economy to more sophisticated economic activities so as to eliminate misuse of resources and disguised unemployment. This solution is emphasized in the Third Five-Year Plan and at the level of regional development even when only the minimum that must be done is discussed.

However, even though village industry development is stressed by the central government, the elaborate policy measures for it have not been implemented enough yet, if at all, for their effects to be felt on the level of village industrial units. The problems which village industries face are manifold: technological, financial, managerial and organizational. Accordingly, in establishing industries in rural areas to raise the income level and to absorb unemployment, policies should be considered from many angles and not just from the viewpoint of infrastructure facilities. For example, people's aspirations are an important element in the sense that villagers should participate in industrial activities with confidence and motivation.

Specific policies such as the "growth pole" approach will not be taken up here, but a certain amount of industrial agglomeration will occur because some industries depend on external economies.

(6) Strategy-6

Improving the technological level, and developing appropriate technology:

Technological inadequacy is a basic and most serious constraint for industrial development of the region. In attempting to develop the industries mentioned above, first of all we have to tackle this problem, which comprises various elements, including production equipment, production tools, and worker skills. In any case, inadequate technology seriously restrains development by causing low productivity, high prices, low quality of products, and so on.

The pottery industry is a good example of low-level production equipment. Pottery wheels or furnaces or kilns are not in use yet. Villagers bake pots in the open instead of using kilns and naturally produce low-quality products. If some new tools or technology were to be introduced, the situation would be vastly improved.

There is a problem which deserves close attention: the selection of appropriate intermediate technology well suited to the local situation. If technology is not suited to the particular situation, it is of little use. The development of appropriate technology is therefore crucial for the region. It can be developed both by modernizing traditional technology and by introducing technology from abroad. From the standpoint of self-reliance, the former is preferable.

Another constraint is worker skills. For example, even if good machinery is installed, its efficiency will be very low if workers cannot use it properly. The results are inferior quality goods which are not accepted in markets and excessive breakdowns of machinery due to lack of proper maintenance. According to our field survey, the latter is widespread in the region. Even if excellent machinery is introduced, under the present poor maintenance and machine management systems, it would be prone to breakdowns, and shortages of spares and parts would occur, leading to underutilization of machinery, low-level production, and the need for additional foreign exchange for spare parts. All of these problems are acute in the region and the country. Especially because of the foreign exchange situation, additional imports of spares parts must be avoided. With proper maintenance and technical guidance and more careful machine foreign exchange.

In this context, it is proposed that first priority be given to a system of regular checkups and periodical maintenance. The most important thing, of course, is proper use on the basis of adequate knowledge of the machinery. So this strategy entails not only introduction of technological systems but also a change in worker attitudes.

(7) Strategy-7

Reorganizing or introducing a distribution system

Generally there is a tendency in developing countries to concentrate attention on production rather than demand. As a consequence, the distribution system from producer to consumer is neglected. Naturally, planning should emphasize both facets of industrialization. Also, producers should produce goods which people want to buy.

Unfortunately, so far improvement of the distribution system has been slow in the region and nationwide, especially in rural areas. In fact, this has created many problems, including short supply of essential goods, high prices and malnutrition. This is a matter of distribution and of the physical network of storage and transportation facilities, all of which are serious problems in the region.

From the producer's point of view, the distribution system is called a marketing system. And this marketing system is underdeveloped even in urban areas of the region. Coordination and harmony between traditional and modern systems is not well established--to the detriment of village industries. Of course, some marketing difficulties can be explained by low quality and high prices of goods from village industries as



a result of production difficulties. However, there remain many problems to be solved in overall marketing. Therefore, we put strategic importance on this task and a programme to provide general marketing opportunities and merchandising services with the help of the Kilimanjaro Regional Trading Company and to provide distribution channels and physical distribution facilities like storage and trucking, especially for village industries. The vital importance of doing so is reason enough to discuss distribution and marketing problems separately from the general institutional setup.

(8) Strategy-8

Establishing and strengthening the policies and institutional setup for production expansion and productivity improvement, especially for rural industries:

As mentioned before, the constraints of industrial development are deeprooted and interrelated. Therefore, countermeasures, too, should be on many fronts and in a package approach. In order to promote this approach, institutional and policy systems relating to industrial expansion and financing, manpower training, marketing, and so on should be thoroughly reorganized and expanded to meet the situation. Needless to say, existing institutions and organizations should be given first priority in this process.

## 9. ACTION FOR CHANGE: PROGRAMMES AND PROJECTS

### 9.1 Strategy and Programmes

The eight strategies proposed in the preceding chapter are here translated into specific programmes and projects.

#### (1) Basic Strategies: Technological Development and Marketing Improvement

According to our diagnosis, the basic constraints which hinder the industrial development of the region are technological and marketing problems. The former include production equipment and manpower training, and the latter marketing organization and product merchandising. All these elements are crucial for eliminating underutilization of production capacity and for further developing industrial activities. However, these problems are related in many ways. Hence a package approach which includes various elements is deemed most effective for breaking the vicious circle of constraints.

Our main countermeasure with respect to these problems is the establishment of a multifunctional Kilimanjaro Industrial Development Centre (DIDC). The Centre will greatly contribute to solving many problems of technology and marketing.

With respect to the marketing system, the KIDC will coordinate traditional markets together with small industries and modern organizations like RTC. For example, it will encourage the distribution of products of village industries to open air markets and to the district RTC.

(2) Strategy of Maximizing Existing Production Capacity

As mentioned before, this problem is most serious for the region as well as the whole country. The utilization rate is said to be around 50% regionally. If this problem is mitigated, production and employment levels will rise without additional new investment.

The causes of underutilization of production capacity are diverse, and technical defects and marketing bottlenecks are among the results. Coping with this problem will be a function of the KIDC. It can provide maintenance and repair guidance as well as vital spare parts.

Strategies, Programmes, and Projects (Table 29)

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Basic Strategies

- |   |                           |
|---|---------------------------|
| 1. Technological Development                              | Kilimanjaro Industrial    |
| 2. Marketing Improvement                                  | Development Centre (KIDC) |
| 3. Elimination of Underutilization of Production Capacity | KIDC                      |

Industrial Expansion	<u>Primary</u>	<u>Secondary</u>
4. Resources-based Industries	New Establishment	KIDC,
5. Basic Industries	& Expansion	Moshi
6. Linked Industries	Projects	Industrial
7. Village Industries		Estate
8. Institutional Intensification	Leasing & Guaranteeing Schemes, Financing, Manpower Systems	

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- (3) Strategies for Industrial Expansion: Local resource-based industries, basic industries, linked industries and village industries.

The development of these industrial units is directly treated in the programme of twenty-two new kinds of industries and expanding industries, and the highest priority will be given to these industries. However, there are many impediments to be dealt with before implementing these strategies. It is expected that they can be eliminated by the KIDC and the Moshi Industrial Estate.

For the development of resource-based industries, the KIDC will undertake resources surveys and development of appropriate technology for greater utilization of local resources. Since metal and engineering industries are representative of basic industries, the KIDC will be equipped with a forge, foundry, and metal-processing and ceramic workshops. Furthermore, the Moshi Industrial Estate will center on metal and engineering units.

Industrial linkage is even more important if one considers that the industries of the region are dispersed in technical and geographical terms and are characterized by a triple industrial structure. Linkage is also urgently needed to raise productivity through an industrial division of labor. Because the main cause of the unintegrated industrial structure is lack of technology, the KIDC will give special technical guidance to village industries as well as to large industries to effect closer linkage.

Industrial linkage is not limited to relations between smaller and larger industries or between rural and urban industries but includes relations between industry

and other economic activities such as agriculture and tourism. The KIDC can encourage agricultural production projects and handicrafts for tourists.

The Moshi Industrial Estate, too, will greatly contribute to strengthening industrial linkage. This is all the more evident when one considers the industries that are proposed for the Estate--primarily metal and engineering industries.

The development of village industries is especially crucial for the full realization of Tanzanian socialism through economic equalization and the development of cooperatives. The KIDC will setup two rural industrial promotion stations for providing speedy industrial services and product displays.

(4) Action for Strengthening of Policy and Institutional Framework

In order to improve the industrial climate and develop industries in the region, an overall frontal attack is needed which calls for institutional and policy reinforcement. Needless to say, the KIDC and the Moshi Industrial Estate are part of this attack. In addition, the following projects and arrangements should be implemented.

(i) Arrangements for Financial System

As mentioned before, the major problems in industrial financing are the weak network of financing institutions in rural areas and lack of credit standing on the part of perspective borrowers.

For the former problem, we propose an increase in the number of bank branches, especially of the Tanzania Rural

Development Bank and the Tanzania Investment Bank. At the same time, additional manpower training is urgent. In these ways, banks will be able to give managerial advice and guidance to small and village industries.

For the latter problem, it is proposed to set up a special leasing and guaranteeing scheme by utilizing a special fund of TIB for small industries. The main objectives of this project is to combine the guaranteeing system with technical assistance.

(ii) Industrial Manpower Training

It goes without saying that the supply of qualified manpower is a decisive element in industrial development. The manpower training of the KIDC will mainly specialize in upgrading worker skills. As far as basic skilled manpower is concerned, other organizations such as the SIDO Industrial Workshops, Rural Training Centres and the Post Primary Technical School will be in charge, after slightly rearranging their present systems. Needless to say, the KIDC will help to strengthen training and teaching staffs in these institutions.

Manpower Training Framework (Table 30)

Institutions	Trainees	Level
KIDC	Skilled or semi-skilled workers and training/ personnel of technical institutions	Grade 1 Grade 2 Grade 3
SIDO Industrial Workshops	Workers with only basic skills	Grade 4
Rural Training Centres		Other grades
Post Primary Technical Schools		

List of Industrial Projects, by Investment Cost, Manpower Requirements and Phases (Table-31)

	1ST YEAR		2ND YEAR		3RD YEAR		4TH YEAR		5TH YEAR		TOTAL		
	INITIAL INVESTMENT	MANPOWER SKILLED OR QUALIFIED STAFF OR NON QUALIFIED STAFF	INITIAL INVESTMENT	MANPOWER SKILLED OR QUALIFIED STAFF OR NON QUALIFIED STAFF	INITIAL INVESTMENT	MANPOWER SKILLED OR QUALIFIED STAFF OR NON QUALIFIED STAFF	INITIAL INVESTMENT	MANPOWER SKILLED OR QUALIFIED STAFF OR NON QUALIFIED STAFF	INITIAL INVESTMENT	MANPOWER SKILLED OR QUALIFIED STAFF OR NON QUALIFIED STAFF	INITIAL INVESTMENT	MANPOWER SKILLED OR QUALIFIED STAFF OR NON QUALIFIED STAFF	
(1) NEW INDUS-TRIAL PROJECTS	850,400	50	969,600	140	1,368,700	112	1,867,200	175	1,989,050	221	7,044,950	662	73
FOREIGN CURRENCY	503,500		506,850		814,050		842,900		975,300		3,642,600		
LOCAL CURRENCY	346,900		462,750		554,650		1,024,300		1,013,750		3,402,350		
(2) EXPAND-ING INDUS-TRIAL PROJECT	700,000	54	1,420,000	108	1,750,000	135	1,750,000	135	2,100,000	162	7,720,000	594	66
FOREIGN CURRENCY	420,000		820,000		1,050,000		1,050,000		1,260,000		4,600,000		
LOCAL CURRENCY	280,000		600,000		700,000		700,000		840,000		3,120,000		
(3) KILIMAN-JARO INDUS-TRIAL DEVELOP-MENT	4,275,384	26	4,108,251	9	10,12,212	6	506,339	2	256,277	2	10,158,463	45	33
FOREIGN CURRENCY	1,082,787		2,926,811		375,075		210,625		60,000		4,655,298		
LOCAL CURRENCY	3,192,597		1,181,440		637,137		295,714		196,277		5,503,165		
TOTAL	5,825,784	130	6,497,851	221	4,130,912	253	4,123,539	312	4,345,327	385	24,923,413	1301	172
FOREIGN CURRENCY	2,006,287		4,255,661		2,239,125		1,753,525		2,295,300		12,897,898		
LOCAL CURRENCY	3,819,497		2,244,190		1,891,789		2,020,014		2,050,027		12,025,515		

## 9.2 Programme No. 1 : New Industries and Existing Industries

The principal aim in programming these projects is to introduce more sophisticated and technologically higher versions of existing industries into the region to an extent requiring elimination of some present industries. The present programme also involves brand-new industries in addition to simultaneously upgrading existing industrial activities both quality-wise and quantity-wise.

### (1) New Industrial Projects

One of the most important ways of boosting industrial activities in the region will be to introduce new, so far nonexistent, industries into the industrial sector. In so doing, the first job that any planner has to tackle in preparing a list of projects is to establish specific criteria for selection of projects and put them in order of priority. Very little has been written in this area, and most of it is arbitrary, with analyses often done at the national level. In most cases, therefore, one cannot find any specific technique or method applicable to a particular area such as the Kilimanjaro Region. It is therefore our own task to set appropriate and suitable criteria for choosing priority projects. For this purpose we have employed the following procedures:

- (i) Arbitrary nomination of projects based on experience and an industrial field survey, the results of which in terms of local industrialists' opinions are summarized in Table 34.
- (ii) Two-stage screening of those projects: a "merits/difficulties" test and "a possibility of implementation" test. The results are summarized in Table 35 and 36.



- (iii) Establishment of project priority criteria. This procedure is based mainly on the previous two screening tests. Also required is consideration of technical, political, economic, and social aspects. These aspects have been examined at the local as well as the national level for the establishment of 10 criteria.

Once the above procedures are completed and certain crucial conditions examined, allocation of new industries within the region is carried out. Then investment requirements for new industries are calculated.

(2) Nomination of Possible Projects

In Table 34, suggested potential (in the eyes of local industrialists) industries are listed in addition to existing industries. In order to indicate degree of potentiality, frequency is compiled in terms of number of times suggested by district. In the field of crop-based industries, there are five newly-suggested industries, of which tomato canning is highly ranked with a frequency of 6 times, followed by coffee canning, fruit canning, an oil extraction business, and pyrethrum processing. In livestock-based industries, a dairy-processing project, a trophy and crafts project, a fish-processing project and a meat-processing project are newly suggested and ranked according to frequency. There are three newly suggested forestry-based industries: a paper-making project, a small wooden article production project, and a chipboard project. In the field of clay and mineral-based industries, a cement products (other than bricks) project and a gemstone processing (or polishing) project are suggested. The cement products project has a relatively high frequency of 7. The sub-group of the metal-based industries has four new industrial projects. They are

a subsidiary materials (such as nails, bolts, nuts and screws) project, a foundry project, an aluminum-casting project and a bicycle repair project. Finally, the non-metal-based industries group has nine new suggested industrial projects. They are a paint-making project, a waste product project, a small paper article producing project, a suitcase manufacturing project, a plastic article making project, a button making project, a paste/glue making project, a soap making project and a windmill equipment manufacturing project. Apart from the two industrial projects mentioned above) whose frequency of suggestion is quite high, all the other industries suggested have a very low frequency, ranging from one to three. This may, in turn, imply that the imagination of local industrialists in terms of industrial diversification is fairly poor. This is then surely a place where government guidance and assistance are necessary.

Keeping all the suggested industries in mind, we brainstormed and summarized the potential industries as follows:

- Trucking Project (1)

This is a project for transportation of industrial projects and raw materials. Therefore, it will be not only an industrial project but also an integral part of overall industrial development

- Chipboard Project (2)

To make the most use of timber and timber waste, it may be possible to establish one chipboard factory in Kilimanjaro, probably like the one in Tanga.

- Stone Crushing Project (3)

There already exist one or two stone-crushing facilities in the region. But here it will be possible to exploit additional stone resources for road construction and building materials.

- Subsidiary Materials Production Project (4)

Some small subsidiary materials such as nails, bolts, nuts and screws are lacking. It is plausible that Kilimanjaro might become a centre for producing a few kinds of such subsidiary materials.

- Foundry Project (5)

The foundry industry provides a basis for all kinds of industrial development. It is hoped that this industry will be established as soon as possible.

- Forging Project (6)

This project should also be established hand in hand with the foundry project. Obviously, this is also a fundamental industry for industrial development.

- Oil Extraction Project (7)

In same, one relatively large oil extraction project is now under construction. However, what may be considered here is some smaller scattered units where oil seeds are available, with the same unit undertaking advanced refining.

- Tomato Sauce Project (8)

Although the volume of tomato production in Kilimanjaro is not known, it is often observed that quite a substantial amount of tomatoes go unsold and rot. Tomato preservation in the form of tomato sauce would be quite beneficial.

- Jam and Marmalade Manufacturing Project (9)

Citrus fruits which are quite plentiful all year round can be utilized for a jam and marmalade manufacturing industry.

- Animal (Livestock) Feeds Project (10)

Livestock, one of the most important protein sources, have to be developed substantially. To make the quality of meat better, livestock feeds must be upgraded and the conditions of their storage improved.

- Calabash Goods Project (11)

This project is already in operation, under the strong leadership of SIDO in Rombo. Though the project itself is successful, there should be room to upgrade product design and quality and expand production capacity.

- Potato and Other Starches Project (12)

Starches are all imported from outside the region in spite of the fact that potatoes, sweet potatoes, and cassava are cultivated locally.

- Meat Processing Project (13)

Smoking of meats as a means of preservation will become increasingly important with the development of livestock. It may be followed somewhat later by the use of freezing instead.

- Bone Crushing Project (14)

Bone powder (together with powdered animal blood) is a useful resource presently wasted. It can be used for both livestock feeds and manure.

- Glue Making Project (15)

Our impression is that chemical glue is very difficult to produce here. Perhaps animal and vegetable glues can be produced by utilizing local resources.

- Dairy Products Project (16)

There is already one fairly large dairy products unit in Arusha. But Kilimanjaro might also be able to produce well-preserved fresh milk, cheese and yoghurt.

- Animal Cooking Oil Project (17)

It should be possible to supply one of the daily necessities, cooking oil, locally. Lard, for example, is quite easily collected from the fat of pigs.

- Charcoal Making Project (18)

Presently local people use firewood for cooking and housewarming. Firewood produces a lot of smoke and is often a cause of fire. Charcoal would be easier to use and safer. It would also be useful for industrial purposes such as at foundries and forges.

- Wooden Toys and Educational Materials Project (19)

The national goal of universal education is in the final stage of attainment. Each region definitely needs educational materials for this programme. It is our conviction that a more sophisticated carpentry unit should be established for this purpose.

- Wheelbarrow Manufacturing Project (20)

In mountain areas where road accessibility is very poor, a wheelbarrow type of short distance transportation would surely make everyday life more efficient and easy.

- Roof Tile Manufacturing Project (21)

Present pottery-making units could be upgraded to produce U-shaped roof tiles to replace the present tin plates. A large variety of other products could also be produced.

- Gemstone Polishing Project (22)

Various kinds of semi-precious and precious stone are to be found in Pare mountain areas. A simple processing project could be established.

- Natural Brick Project (23)

This project has long been underway on a relatively small scale. The project would be substantially promoted if production were to be partly mechanized and precision work introduced.

- Gypsum Processing Project (24)

Gypsum deposits are quite considerable. Although raw gypsum is not a much use industrially, when it is processed, gypsum becomes a far more important raw material for industrial products.

- Magnesite Mining Project (25)

As a possible new mining project, magnesite is tentatively chosen here. It is probably possible to exploit some other minerals in the region.

- Scrap Metal Treatment Project (26)

Scrapped cars, machinery, and equipment could be sorted out according to metal characteristics and used for industrial metal products after reforming.

- Fashion Button Manufacturing Project (27)

Fashion buttons made out of animal skin and ivory and some wooden materials could be produced mainly for export to industrialized countries, where they have higher value.

- Tailoring Project (28)

This project is for reorganizing small tailoring units into relatively bigger ones to produce various kinds of uniforms and office garments.

- Knitting Project (29)

Knitted wear is quite popular among those who live in mountain areas. Even in the lowlands, during the rainy and winter seasons it is cold enough to necessitate a cardigan or pullover.

- Dye Making Project (30)

It may be possible to extract some dyes from natural grasses and trees available in the region. This will require some intensive research. In addition, there is a possibility of introducing a chemical dye production unit.

- Hand Loom Weaving Project (31)

This project can only be possible if it produces artistic products or some unique quality products. The tourist-souvenir type of product could be developed.

- Soap Making Project (32)

There are few local soap making industries in the region. Although large soap manufacturing industries are in operation outside the region, it would be beneficial to a considerable portion of the local

population to supply relatively cheap soap from nearby industrial units.

- Basket Making Project (33)

Plenty of dried straw baskets and similar products are seen on the market. Most of them are imported from other regions. The Kilimanjaro Region can produce similar products from, for example, sisal and other dried straws.

- Salt-Refining Project (34)

Salt, a necessity of life, cannot be produced from seawater in an inland region like Kilimanjaro. But it would be possible to establish a refining project for rock salt or raw salt, which would incidentally produce some chemical by-products useful for industrial development.

- Solar Heat Utilization Project (35)

Plentiful solar heat can be utilized in several ways. One possibility is to manufacture hot water supply equipment which would utilize solar heat. Hot water produced in this way could be used for washing, bathing, and drinking, thus reducing consumption of energy sources such as gas and electricity.

- Hand Pump Manufacturing Project (36)

Where there are wells, hand pumps are needed. The project could be of the assembly type in the beginning.



- Chalk Manufacturing Project (37)

The manufacture of chalk is recommended here as an essential educational material. As demand for this product is enormous, it is hoped that a plant of reasonable size will be introduced into the region.

- Bicycle Seat Project (38)

Bicycles are becoming increasingly popular. But it would be difficult to establish a whole assembling plant in any one place. Fortunately, a large bicycle manufacturing factory is nearing its completion in Dar es Salaam. The Region would be very lucky if it could supply all the seats for that factory.

- Egg-shaped Briquette Project (39)

A project for manufacturing briquettes project as a cleaner and long-heating energy source is recommended. The detailed know-how for such a project exists in Japan.

- Local Medicine Manufacturing Project (40)

Kilimanjaro, like other regions, should have some kinds of herbs that can be used for medical purposes. The present local medicines of this sort should first be analyzed scientifically and then be industrialized.

- Oil Revitalization Project (41)

This type of plant would undoubtedly be useful for not only the region but also the country as a whole since oil is such a precious commodity.

It is not our intention to suggest that all these suggested industries can be undertaken at once. It is first necessary to take various conditions into consideration in the industrial sector of Kilimanjaro and carry out the "two-stage Screening Tests" on the projects. And finally, on the basis of those tests, we can select the more easily implemented if the projects.

### (3) Two-Stage Screening of Nominated Projects

#### - Merits/Difficulties Test

Firstly, all these nominated projects are screened carefully by means of a "Merits/Difficulties" test. Information on both merits and difficulties of implementation of the projects is collected from surrounding factors, in quite broad terms, such as industrial scale of production (viable scale merits and so on), technical factors, number of similar industries, and a very rough estimation of the economic return of a particular scale of production. In this way, fundamental characteristics and problems being faced by each project are identified and summarized in a descriptive way.

Through the above procedure a fairly large number of projects are eliminated on the following grounds:

- (a) Large-scale industries which involve extremely high foreign as well as domestic investment and which are primarily in the hands of the central government: (2), (4), (24), (25), and (34).
- (b) Technically too complicated and sophisticated: (15), (27), (34), and (36).

- (c) Extremely unfavourable location factor, i.e., too close to Arusha and Tanga, which already have very effective identical industries: (16) and (32).
- (d) Total absence of information concerning production possibilities and thus requiring more detailed pre-production surveys and research: (24), (25), (30), (33), and (40).
- (e) Economically unjustifiable: (31), (35) and (37).
- (f) Not new but rather involving expansion: (11) and (23).

As a matter of fact, this test goes a long way toward eliminating projects too difficult to be implemented in the region over the coming five years. However, elimination has not been based on the first test alone. There is also a second "possibility of implementation" test, by means of which we have identified a large number of projects not satisfactory with respect to such things as obtainability of raw and subsidiary materials, production means, and characteristics of production. Thus, these two stages of screening are interrelated.

- "Possibility of Implementation" Test

The "possibility of implementation" Test is the second stage of testing and clarifies the details of the selected 24 industrial projects, which are neatly arranged in Table 3. In this Table, various information and data are categorized into three broad items: "Raw/Subsidiary Materials," "Production Means," and "Products."

Raw/Subsidiary Materials are further specifically divided into "Kinds," "Source," and "Available Quantity." The Production Means are again subdivided into "Kinds of machines/equipment," "Source," "Costs,"

"Life of Project" and further "Level of Skills Required," "Educational Background Required," and "Expected Employment per Unit." Finally, the products are subdivided into three sub-items and characterized by "Kinds," "Whom and Where to Sell" (Marketing), and "Production per Day."

In spite of the close relationship between the two tests previously pointed out, the second test stage has its own importance. It specifies to a fuller extent the characteristics of production units. For example, the tomato sauce project has turned into a tomato puree project; the gemstone project is planned for two different sites, one at the mining site for stone collection and the other at Same for polishing stones; the edible oil extraction project will tentatively use sunflower seeds and ground nuts, though their availability is questioned, and so on. Before listing the finally selected industrial projects, we must emphasize that the process of this short listing does not necessarily mean that the excluded projects can never be implemented in the region, but, rather, it means that they need to be restudied and researched in a more rigid manner, not only at the regional level but also at the national level.

The final selection of industrial projects totals 23 units as follows:

- Trucking Project (1)
- Stone Crushing Project (3)
- Foundry Project (5)
- Forging Project (6)
- Oil Extraction Project (7)
- Tomato Puree Project (8)
- Jam and Marmalade Manufacturing Project (9)

- Animal Feeds Project (10)
- Potato and Other Starches Project (12)
- Meat Processing Project (13)
- Bone Crushing Project (14)
- Animal Cooking Oil Project (17)
- Charcoal Making Project (18)
- Wooden Toys and Educational Materials Project (19)
- Wheelbarrow Manufacturing Project (20)
- Roof Tile Manufacturing Project (21)
- Gemstone Polishing Project (22)
- Scrap Metal Treatment Project (26)
- Tailoring Project (28)
- Knitting Project (29)
- Bicycle Seat Project (38)
- Egg-shaped Briquette Project (39)
- Oil Revitalization Project (41)

#### (4) Priority Criteria and Priority Test

Reviewing the above two procedures and reviewing also the important policy considerations described in earlier chapters, we establish ten specific criteria, believed to be appropriate and crucial:

##### (i) Criterion of availability of raw materials

Being an inland region, Kilimanjaro is in a weaker position to start industrial projects by importing various raw materials from other regions or countries unless there is an acute demand within the region and/or nearby regions. It is therefore better that raw materials be available near the industrial sites. It is also practical to take into consideration the quantity of available raw materials. Thus, raw materials are one of the most important criteria.

(ii) Criterion of availability of subsidiary materials

It has been pointed out in previous chapters that lack of subsidiary materials such as nails, bolts, nuts, ring washers, welding bars and varnish is quite serious. Without a sufficient supply of these materials industrial activities are discouraged. In this case as in the case above, they should be made available within the vicinity of the industrial unit.

(iii) Criterion of availability of production means

Here "production means" means machinery and equipment for industrial production. Machinery and equipment manufacturing industries are almost nonexistent in the region. This being the case when industrial projects start, equipment has to be procured. New and expensive imports constitute a time-consuming burden. If they are available, the nearer they can be obtained and the lower the cost, the better.

(iv) Criterion of technical level required

New industries require a certain level of skills and technology to keep production going. In this respect, as a rapid increase in skilled manpower cannot be expected, our position is that the lower the level of skills and technology to begin with, the more basic the level of industry to be established.

(v) Criterion of effects on employment

The employment problem is a social as well as an economic problem in this region. It is to be hoped in both political and administrative terms that employment will be created by the development of labor-intensive small-scale industries. This criterion, therefore, is established with this aim in mind. In our planning, with all the projects being estimated at a level of minimum investment, which can be expanded as demand expands, the employment

effect is ranked high when employment exceeds 10, medium when between 5 and 9, and small when less than 4.

(vi) Criterion of demand for products

Demand estimation is a most difficult problem. But fortunately our field survey and data collected from the statistics of the Regional Trading Company as well as the demand for various commodities in the Moshi market as observed by the resident team over a one-year period provide quite reliable information to register what the demand actually is.

(vii) Criterion of import substitution

Quite a large volume and variety of commodities and industrial products are imported from outside the country. Import substitution can be one of the first targets to be achieved in this region. As a matter of fact, this is the starting point for the region to implement a policy of self-reliance.

(viii) Criterion of possibility of exportation

Keeping in mind that the country is facing the acute problem of a shortage of foreign currency reserves, the region of Kilimanjaro should contribute to a remedy as much as possible by considering plausible industrial projects. For this reason this criterion is established, and any industry that involves exports is entitled to more serious consideration than others.

(ix) Criterion of economic scale of production

Today the criterion of economic scale of production is one of the most crucial problems in industrialized countries. This is because whether a project pays or not depends solely on the amount of production, which reduces cost per product. In other words, unless a production

scale is big enough to make the price (as well as the quality) of a product competitive in the market, no investment can occur. This principle applies also to the industries in this country. However, for the sake of establishing foundations for future accelerated industrial development, it is necessary to overlook this principle somewhat and pay attention to smaller and reasonably efficient industrial units in the region.

(x) Criterion of basicness of the industry

A definition of basic industries has already been given in an earlier chapter. This criterion is, in fact, national policy oriented. It is expected that once these basic industries are established, industrialization itself and also industrial diversification through linkage effects will be accelerated.

In order to decide priority of the various industry projects, a simple grading method is introduced. This method gives from 1 to 3 points in accordance with the degree of importance, that is, Point 1 gains the highest mark, followed by Points 2 and 3. Final scores are produced by adding up all these points from the ten criteria, and, of course, the lower the total figure is, the higher the priority is. Table 37 is self-explanatory. It summarizes the above ten criteria.

Table 38 outlines the criteria for priority as mentioned above, and, Table 39 outlines the resulting scores. In the latter table, six groups are categorized as lower-point industries. The lowest score is 16 and the highest score is 22. The results should, however, be read as being somewhat arbitrary. But we should note again that these 22 industries are those which have high potential in absolute terms in that we carefully screened out earlier other possible industries with drawbacks to them.



(5) Geographical Distribution of New Industries

A detailed investment schedule for 22 new industrial projects is given in the Appendix. Regardless of initiation year, it covers a five-year period for planning purposes. Investment requirements of both fixed capital and working capital are calculated according to items of cost. Then the 22 investment schedules are specifically allocated over the region. The summary of the investment schedule is treated in the following section, and here locational distribution of the projects is determined in terms of a time table.

In the allocation the following basic considerations have been taken into account:

(i) Policy-oriented Elements

- (a) Overall diffusion of industries over the region and rural areas with the aims of encouragement of rural industrialization, minimization of outflow of rural population, and balanced development of the region.
- (b) Small industries relating to daily necessities such as clothes, food, shelter, and basic production tools will be preponderantly located, as far as market size permits, in rural areas. Thus, these industries can be classified, in terms of market size, as word-level industries, district-level industries, and regional level industries.
- (c) "The growth-pole policy," which intentionally concentrates some industries in specific areas or towns, will not be adopted.

(ii) Technical Elements

- (a) The project sites should be situated near existing resources. This is particularly true in the case of mineral-based industries such as the roof-tile and burnt/natural brick projects and the stone crushing industry.
- (b) Industrial utilities should be within reach of the projects: Electricity, in particular, should be considered in relation with machinery/equipment to be procured. Take the foundry and the forging projects, for example. They are all to be located where electricity is available. Even the gemstone polishing project will have its polishing factory in Same Town.
- (c) The market should be near the production site. Locally demanded and consumable products such as processed agroproducts are expected to be produced where the local population can provide markets. Thus, various production units of this kind are to be more or less equally distributed among four districts.
- (d) The industrial linkage effect should be one of the decisive factors in allocating particular industries. The meat processing project, the bone crushing project and the animal cooking oil project are, in fact, linked to each other. To start these projects, the industrialist has to collect a sufficient amount of bones and fat (meat would not be so difficult so far as one can buy it) from various small slaughterhouses nearby. A certain degree of upgrading of slaughtering techniques will also be required.

The above considerations have been applied to each of the finally selected industries for their geographical and time-sequence allocation. The results are shown below and in Table 40.

Locational Identification (Table-32)

Name of Project	No.	Location	Identification
1. Trucking Project	4	Central Siha, Moshi Town, East Mkuu, Same	Located in the centre of each district to cover the whole district area and to provide a prompt distribution services.
2. Stone Crushing Project	5	Moshi Town, Mkuu, East Mengwe, Gonja, Kighari	(1) For road construction, Rombo and Pare are selected in terms of market accessibility and material availability. (2) For building construction, Moshi Town which is a big market is selected.
3. Foundry Project	2	Moshi Town, Same	By the necessities of larger market size, material availability, large electricity consumption and linkage effects, the two major towns are picked up.
4. Forging Project	4	East Machame, Moshi Town, Marangu, Same	In terms of material availability, industrial linkage and electricity requirement, the four wards are selected. Rombo is covered by Marangu.
5. Oil Extraction	5	Sanya Juu, Moshi Town, Mkauu, Kighare, Gonja	As this cooking oil is produced from cotton and sunflower seeds, the decisive factor is an easy access to raw materials. (1) Cotton seed oil: Moshi Town, Kighare, Gonja (2) Sunflower: Sanya Juu, Mkuu.
6. Tomato Puree	3	Sanya Juu, East Yunjo, Central Usseri	As materials are ripen tomatoes, the major problem is to be perishable. Location is selected near to producing area.
7. Jam and Marmalade	2	Moshi Town, Mshewa	Marmalade is allocated near to producing area. Apple and strawberry jam is located near to consumption market.
8. Animal Feeds	3	Sanya Juu, North Mashati, Kishiwani	Located in areas which maize husk, rice bran, honey etc. are easily collectable. Market is district-based.
9. Potato & other starch	3	East Masama, East Mengwe, Same	Location is near to material producing areas. Market is district-based.
10. Meat Processing	10	East Machame, West Masama, Central Siha, West Kirua Uunjo, Moshi Town, West Mengwe, Tarakea, South Mashati, Kighare, Lembeni	As the product is a long-term preservative smoked meat, location is near to material producing areas market is district-based.
11. Bone Crushing	4	East Machame, Moshi Town, South Mashati, Kighare	Located in the place which waste animal bones are available and which is linked with other livestock industries. Market is district-based.

Name of Project	No.	Location	Identification
12. Animal Cooking Oil	4	East Machame, Moshi Town, South Moshati Kilongwe	As raw materials are mainly available from meat processing factories, industrial linkage should be important. Market is district-based.
13. Wood Toys and Educational Materials	4	Sanya Juu, Moshi Town, Mkuu, Same	As major market is to primary school pupils, location is in the centre of each district.
14. Charcoal Making	8	Central Kibosho, East Uru, North Usseri, Tarakea, West Masama, Vuje, Mtif Kilongwe	Location is mainly based on raw material availability. Market is district-based.
15. Wheelbarrow	4	Central Kibosho, Mashati Olele, Msangeni, Same	As major users are peasant farmers, location is decided based on market accessibility.
16. Roof Tile, Clay Pipe etc.	3	East Machame, East Mengwe, Kighare	Located near to clay producing areas. Market is region-based.
17. Natural Stone Bricks	1	Tobeta (East Mengwe)	Raw material is "Tabeta Stone", meantime market is to a whole area of the region.
18. Scrap Metal Treatment	5	Machame, Moshi Town, Marangu, Himo, Same	As major aim is to supply metal materials to forging and foundry factories near-by, location is allocated near to these linked factories and in the centre of road networks.
19. Knitting	3	West Oldmoshi, North Uru, Tarabea	Location is based on marketability. Major buyers are people of Northern area of relatively low temperature.
20. Tailoring	4	North Machame, Moshi Town, Himo/Marangu Same	Location is based on market areas which are mainly connected with school pupil.
21. Bicycle Saddle	1	Moshi Town	Located near to major supplier of leather, for example, Tangania Tanneries, the customer could be the National Bicycle Co. P.S.M.
22. Gemstone	2	Bendera, Same	Located near to minerals producing areas.
23. Oil Re-vitalization	2	Moshi Town, Himo	Located near to major traffic centre which are easy to collect waste oil. Market is region-based.
24. Oval Buquette	3	West Shiha, Moshi Town, North Mashati	Located near to the places which are easy to procure major raw materials such as saw dust and coffee husk and to the possible bigger markets.
Total	89		

## (6) Expansion of Existing Industries

The present position of development of existing industries has been viewed in an earlier chapter. Target projection for expansion of existing industries has also been performed in Chapter 7 together with that of new industries. Therefore, an expansion programme for existing industries can be prepared along the same lines as the programme for new industries which has already been completed. It is very unfortunate that crucial information concerning installed machinery/equipment, its condition and value (or price if similar equipment were to be purchased today), and production per month--in short, all those items categorized in Chapter 3--could not be obtained in our survey or otherwise. This fact prevents us from pinpointing specific industries to be expanded and the extent of such expansion. Therefore, we are, in a way, not in a position to indicate specific investment requirements for expansion of existing industries.

Nevertheless, a tentative priority test for expansion industries has been carried out as per Table 43. This test, too, has employed the 10 criteria previously specified. Some of these criteria are not very suitable for the present test. First of all, since this test does not contain any criterion concerning the relationship between the number of existing units and the number of employees, when we judge the employment effect, which number, the total employment of all the units or the average employment per unit, should be chosen? Secondly, the seventh criterion, "possibility of import substitution", has to be converted to "degree of import substitution", and "possibility of exportation" to "degree of exportation." This adjustment is simply due to the fact that production activities have already

long been undertaken by the existing industries. Thirdly, as for determination of level of skills, if the industry employs higher skills and is producing good-quality products, one may argue that as the industry can easily expand its activities with higher skills, this industry should acquire a higher mark. Fourthly, the viable scale of production, the ninth criterion, can be dispensed with on the ground that not only small-scale but also medium- and large-scale industries shall be given equal opportunity to expand if required and necessary. Fifthly, the sixth criterion, "demand for products," can be combined with the notion of "Profitability of production". Finally, one more consideration should be given more attention. That is, if there are any industries whose inputs which are presently imported can be replaced by locally available resources, additionally higher priority has to be accorded.

The above considerations are introduced not in a rigid manner but in a more general way, obtaining the results shown in Table 44. As more ambiguity is involved in this case than before, the ranking has been accomplished by dividing all the existing industries into four priority groups. The totals of the different industries are arranged in four groups from lower to higher priority.

Although limited data and information do not allow us to carry our detailed programming of expansion of existing industries further, let us, in Table 45, reproduce the projected investment requirement of Chapter 7 with the small qualification of new introduction of foreign exchange to cover 60 per cent of total fixed capital requirement. As for working capital requirements, figures indicated here are exactly the same as before.

(7) Toward Implementation of New Industries

In our planning, new industrial projects are understood to be undertaken largely by private initiative. As has already been seen in the previously analysis, it is a fact that the private industrial sector has been playing by far a more important role in spite of the fact that the cooperative movement has been thoroughly introduced into the rural industrial sector. It would, therefore, be impossible to eliminate all private industrial productive activities. Instead, it is recommended to encourage them in an organized manner within the framework of the industrial policy of the nation. It has been revealed through our survey that people in Kilimanjaro are very keen on starting new projects, provided that surrounding conditions allow. At present, however, most of them are rather reluctant to do so owing mainly to ambiguous policy with respect to demarcating fields of private industrial activities and those of public industrial activities.

In all countries of the world, industrial development is encouraged by government. In Tanzania, too, the Government has been putting particular emphasis on the development of the industrial sector. What is not clear, however, the extent to which the public sector should lead or regulate industrial activities in terms of both kind of industry and volume of industrial production. It would be ideal if all small- and medium-scale industrial units were to be converted into cooperative industries there are many things which have to be reshuffled and upgraded, including organization, manpower, and management. Keeping all this in mind, one can clearly see that implementation and development of new industrial projects cannot be achieved solely by cooperative efforts. This is the very reason

why almost 50 per cent of industrial projects are to be initiated by individual investors in Kilimanjaro.

One might then, ask "How can investment funds for those industrial projects be raised?" In the region there are four most accessible financial sources: the National Bank of Commerce, the Tanzania Rural Development bank, the Government Development Funds (subsidies), and "Cash Savings at Home". The first two are formal banking institutions, NBC dealing only with working capital and TRDB only supplying investors with fixed capital. Detailed discussion of these banking institutions is to be found in the main report. However, it is advisable that the newly proposed Kilimanjaro Industrial Development Centre assist these banks by preparing feasibility/technical studies for prompt disbursement of investment funds. Government subsidies consist mainly of the Regional Development Budget and Regional Development Funds from the Prime Minister's Office. All those subsidies have so far been spent on various projects including other sectors as full grants. This practice should be subjected to closer scrutiny. In our target projection in Chapter 7 we limited the rate of subsidization to 25 per cent of total fixed investment costs. In practice, however, this can be flexibly extended to between 25 per cent and 50 per cent for more effective implementation of priority projects.

Finally, "Cash Savings at Home" can also be regarded as one of the most important fund sources. Of the total volume of existing cash only 30 per cent is reported to be in circulation in a true sense. In other words, 70 per cent of all money is being saved by a large portion of local population in their own homes. If banking activities penetrate into local



areas of the region, monetary circulation will become more active, and investment funds can be channeled through formal banking institutions. But what we are particularly concerned about here is the fact that there is quite a large number of would-be entrepreneurs with their own cash in hand. This potential should surely be exploited through Governmental incentives.

Another very important question is economic feasibility, the economic rate of return of each proposed project being indicated at both full capacity and 70 per cent capacity in Table . The marketability of most of those projects has been investigated product by product by assessing the Kilimanjaro Regional Trading Company's sales within the region. As the K.R.T.C., claims that it has been accounting for 85 per cent of wholesale business in the region, real demand for products should be much higher than the figures indicate. In addition, most of the products of the proposed projects are presently imported either from other regions of Tanzania or from foreign countries.

For those products which are not handled by the K.R.T.C., we collected data either by visiting specific industries which are directly or indirectly connected with the products of the proposed projects or by calculating presently consumed household energy in terms of charcoal and/or sawdust briquettes. Incidentally, all these data were, needless to mention, taken into consideration in the priority ranking test described in the previous section.

## (8) Investment Requirements of New Industrial Projects

Projection of investment requirements for new industries has already been described in Chapter 7.

This, however, does not have any practical implications. The investment requirements were therefore computed on several assumptions.

In this section, however, we are in a position to calculate investment requirements on the basis of implementable schedules. The geographical allocation of new industries has already been carried out in the previous section, so we know where they are to be established. Combining these data and adding fixed capital requirements and working capital requirements over the five-year period, practical investment requirements for fixed capital and working capital have been obtained as indicated in Table 41.

In Table 41, total capital requirements and the foreign currency portions thereof are shown side by side under each fiscal year. This comparative presentation is only applicable to the fixed capital as cost items of working capital do not involve foreign currency requirements. As for the fixed capital requirements, projected figures exceed the present figures by far except for 1977/78. This is simply equipment be procured from abroad. At the end of the five-year period, the total investment requirements for fixed capital of the present case fall short of those previously projected by 3.2 million shillings. This kind of discrepancy between projection and practical planning is very common. However, one should note that the case presented here is only one of the practical alternatives. With more and detailed data and information, it would be possible

to alter the present investment programme to a extent.

As for the working capital requirements, the assumption in the previous chapter (18,000 shillings per unit per year) matches quite closely the present planning. In Table 42 the previously projected working capital, slightly adjusted according to the number of industrial units to be established, and the present working capital requirement from Table 42 are compared. Over the first three years we can see a big discrepancy in the figures, resulting in a very narrow gap in the overall total between them. The last two years, however, show very close correspondence between the projected working capital and the present working capital.

Suggested Potential Industries Based on Local Resources (Table-34a)

Kind of resource	Category of industries	Hai	Moshi			Pare
			Urban	Rural	Rombo	
Crop Based Industries	Coffee Pulper	1				
	Rice Mill					1
	Maize Mill				3	
	Sugar (Jaggery)					1
	Sisal Processing					
	Feed (Maize)					
	Cotton Ginning					
	Calabash Goods				1	
	Lamp Shade					
	Mosquito Coil					
	Pyrethrum			1		
	Tomato Canning	2		3	1	
	Coffee Canning	1				
Fruit Canning	1					
Livestock Based Industries	Oil Extraction	1				
	Hide and Skin	1				
	Leather Goods	4	1		9	2
	Trophy and Crafts	1	1			
	Dairy Products		2			2
	Meat processing					1
	Fishing					2
	Saw Mills	5	2	2	9	5
Carpentry	12	1		9	3	
Forest Based Industries	Plywood				1	
	Furniture	1	1			1
	Vehicle body					
	Crafts					
	Paper-making	1	2			
	Small wooden Articles					
Chip Board		1		1		
Clay and Mineral Based Industries	Gypsum					
	Brick (burnt)	4	2	1	9	2
	" (cement)					
	Pottery (tile)	2	2	1		2
	Gravel		1			
	Cement	2				5
Gemstone Processing						
Metal Based Industries	Tin and Blacksmith	5	1	1	3	
	Metal Working	10	3		1	4
	Engineering	1	1		2	
	Auto-Workshop					
	Spare parts making					
	Aluminium	1				
	Nails and screws, etc. (Sub-material)		3			
	Foundry	1				
	Bicycle Garage					

Suggested Potential Industries Based on Other Than Local Resources (Table-3)

Kind of resource	Category of industries	Hai	Moshi		Rombo	Para
			Urban	Rural		
Non-metal Based Industries	Bakery	3			4	1
	Tailoring		1		11	3
	Textile Piece Goods	7				
	Soft drink bottling					
	Sweets and Confectionary					
	Retracted Tires					
	Cooking Fat					
	Chemical Goods			1		
	Building and Civil Engineering					1
	Paint Making	1		1		
	Wax-Products	1				
	Box-Files and Labels					
	Exercise Books			2		
	Candle Making			2		
	Suit-Case			1		
	Plastic Industry			2		
	Buttan Making					
	Paste/Elastic			1		
	Soap Making			1		
	Windmills					

Industrial projects	Economically viable scale of production	Merits	Difficulties	Other comments
1. Trucking Project	-	Contribution to distribution products and production inputs between villages and towns.	-	Technical guidance on how to use, drive, repair for a longer life is necessary.
2. Chip Board Project	Medium scale production	Waste timber is utilized. For-energy source for boilers. Raw dust/waste can be burnt.	Raw materials have to be processed over very huge area of Kilimanjaro. Investment cost is very high.	
3. Stone crushing Project	Small scale production	Local resources are utilized. This project tends to be labour intensive.	Short term training on grinding technique is necessary.	Crushing into smaller stones would be necessary at the site.
4. Subsidiary material Production Project	Large scale production	As sub-materials are very scarce all over the country, there would be high possibility in exporting to other regions.	When the market is small its difficult to make a large production unit profitable. Difficulties in obtaining raw materials such as from bars and steel sheet.	
5. Foundry Project	Small scale production	This is one of the best industries for industrial development. Existing industries would benefit from this unit. Scrap metal is re-utilized.	How to supply energy at a low cost and continuously. How long scrap-metal to be used?	Waste oil may be utilized as energy source.
6. Forging Project	Small scale production	One of the most important and basic industries. Complementary to the existing industries. Spare parts would be supplied through this project. Heat treatment becomes available. Scrap metal is re-utilized. Contributes to the village industries.	Would coke or heavy oil be readily available? Two or more years of training is required.	

Industrial	Economically viable scale of production	Merits	Difficulties	Other comments
7. Oil Extraction Project	Small scale production	Oil seed would become a cash crop.	Raw material supply will be unstable. Collection of the oil seed would become problematic.	Primary processing can be done at villages. Secondary processing is recommended to be done in Moshi Town.
8. Tomato Sauce Project	Small scale production		Constant tomato supply.	
9. Jam and marmalaid Project	Small scale production		Constant tomato supply.	
10. Animal feed Project	Small scale production		Repercussion between human food and animal feeds...Availability of raw materials.	
11. Calabash Goods Project	Small scale production	Diversified utilization of calabash goods.	Better designing and merchandizing is required.	SIDO has already started the project in Rombo.
12. Potato and other starch project	Small scale production			
13. Meat processing Project	Small scale production	Through this project slaughtering technique will be up-graded. Animal fat and animal bones then can be utilized.	Bones have to be collected by visiting each slaughterhouse.	Smoked and dried meat project seems feasible.
14. Bone Crushing Project	Small scale production	Utilization of presently wasted resources.	Bones have to be collected by visiting	
15. Glue making project	Small scale production	Utilization of presently wasted resources.		
16. Dairy processing	Medium scale production	Contribution to milk preservation in a different form.	How to collect milk and availability of necessary amount of milk is the main problem.	Even Arusha Maziwa (milk) is in short supply of fresh milk.
17. Animal cooking oil project	Small scale production	Presently imported cooking oil will be replaced by this project.	Depends on availability of fats from various slaughterhouses.	

Industrial	Economically viable scale of production	Merits	Difficulties	Other comments
18. Charcoal making Project	Small scale production	No problem of smoke and less wasteful utilization of calories/energy. Co-incide with the movement of universal primary education.	Charcoal making method has to be improved. Selection of specific designs and precision work.	Cooking stove has to be modified to be more useful.
19. Wood-toy and Educational materials Project	Small scale production	Short-distance transport of goods becomes much easier.		Woodwork and metalwork have to be combined.
20. Wheelbarrow manufacturing project	Small scale production	Supply crucial building materials to local houses. Contribute to up-grading of local housing conditions.		There is a sample kiln in Doma which was built by Italian experts utilizing locally produced burnt bricks.
21. Roof Tile Manufacturing project	Small scale production	Exportation is expected.	High technical skill is needed.	Much more detailed survey/research/investigation is necessary.
22. Gemstone Exploitation and Polishing Project	-	Fuller utilization of existing natural resources. Exportation can also be expected.	Transport and accessibility to the project site.	The unit has long been in operation in lower Rombo. It is said that big old buildings in Nairobi were built by those stone bricks from Rombo.
23. Natural Brick Project	Medium scale production	Processed Gypsum has a large variety of uses for industrial production.	A very costly project which involves a large amount of foreign currency.	Demand for Gypsum-oriented products have to be identified at national level. Move intensive investigation into deposits, quality and etc. is necessary.
24. Gypsum Processing Project	Large scale production	Utilization of existing natural resources.	Transportation to magnesite consumers.	More intensive investigation into deposits, quality and etc. is necessary.
25. Magnesite Mining Project	Medium and large scale production	Huge amount of scrap metals left idle in the region can be utilized for some time.		
26. Scrap metal Treatment Project	Small scale production	Fuller utilization of wood, animal skin and Ivory.		
27. Fashion Button manufacturing project	Small scale production			



Industrial	Economically viable scale of production	Merits	Difficulties	Other comments
28. Tailoring Project	Small or medium production	To increase production efficiency and variety of production.	How to organize it or who organizes it? Is there any guarantee that tailors get more income.	
29. Knitting Project	Small scale production	To serve the demand in the rural mountain area where it gets quite cold at night and during winter season.	Some skills are required Raw materials must be mostly imported.	
30. Dye making project	Small scale production	Local resources utilization.	Any raw material in the local area? No information so far has been obtained.	We only consider natural dye (not chemical).
31. Hard Loom Weaving Project	Small scale production	Salable to tourists when products are attractive.	Artistic inspiration is required. Raw materials have to be imported.	
32. Soap Project	Small scale production	Soap would become available even in a remote place.	How to compete against relatively cheap/good quality soap produced outside the region.	
33. Basket making Project	Small scale production			
34. Salt refining Project	Medium and large scale production	Can expect various chemical by-products. Table salt would be exportable to other regions.	Large investment on sophisticated machines equipment. Markets have to be ensured.	
35. Solar Water Utilization Project	Small scale production	Solar heat utilization.	Demand and need for hot water are not known.	
36. Hand Pump manufacturing project	Medium scale production	Pumps can be utilized at all wells in the region.	Skills and subsidiary materials are needed.	Foundry and forging units have to be related.
37. Chalk manufacturing project	Medium scale production	Can supply to all kinds of schools and offices.	Highly processed gypsum is the raw material.	
38. Bicycle Saddle Project	Small and Medium scale production	Diversification of leather goods.	Markets have to be guaranteed at bicycle manufacturing and	National Bicycle Co. Ltd. would be the candidate.

Industrial projects	Economically viable scale of production	Merits	Difficulties	Other comments
39. Oval (Egg-Shaped) Bricquette Project	Small scale production	Low cost energy project very useful for domestic consumption. The product has long-life burning ability.	Coal dust is one of the ingredients.	
40. Local Medicine manufacturing Project				Intensive research is required both at the regional and National level.
41. Oil Revitalization Project	Small scale production	Presently wasted heavy oil would be re-vitalized to the point where it is new.		

Implementation Possibility Test (Table-36a)

Industrial project	Kinds	Raw/sub materials where from obtainable	Available volume
Trucking Project	-	-	-
Stone Crushing Project	Rocks and Stones	Locally	Abundant
Foundry Project	Scrap Metal	Locally	Abundant
Forging Project	Scrap Metal	Locally	Abundant
Oil Extraction	Sunflower Seeds Groundnuts	Locally	Unknown
Tomato Puree Project	Tomato	Locally	Limited
Jam and Marmalade Project	Orange Lime	Locally	Limited
Animal feed Project	Maize, maize Husks, Rice, Rice Waste Coushed bones	Locally	Moderate Amount
Meat Processing Project	Cow(Ox), Pigs, Goat, Sheep	Locally	Moderate Amount
Bone Crushing Project	Raw Bones	Locally	Moderate Amount
Animal Cooking Oil Project	Animal Fat	Locally	Limited
Charcoal Making Project	Wood	Locally	Moderate to Abundant
Wood Toys and Education- al material Project	Wood	Locally	Abundant
Wheelbarrow Project	Wood and Iron	Locally	Moderate Amount
Roof Tile Project	Clay	Locally	Abundant
Gem Stone Project	Various Gem Stones	Locally	Un-known
Natural Brick Project	Tabeta Stone	Locally	Abundant
Scrap Metal Treatment Project	Scrap Metal	Locally	Abundant
Tailoring Project	Cloth	Locally	Abundant
Knitting Project	Woolen Thread	Import	Limited
Bicycle Saddle Project	Leather	Locally	Moderate Amount
Oval Briquette Project	Charcoal starch sawdust	Locally	Moderate Amount
Oil Revitalization Project	Potato and Cassava	Locally	Moderate Amount
Potato and Starch Project	Potato and Cassava	Locally	Moderate Amount

Implementation Possibility Test (Table-36b)

Industrial project	Kinds	Products whom, where to sell	Production per day
Trucking Project	-	-	640 km
Stone Crushing Project	Crushed Stone	Construction Govern- ment	10 t
Foundry Project	Repair Parts	Industries	780 kg
Forging Project	Agri Implement parts	Industries	300 kg
Oil Extraction	Edible Oil	Villagers	20 kg
Tomato Puree Project	Tomato Puree Factory	Tomato Source	300 kg
Jam and Marmalade Project	Jam and Marmalade	Restaurants, Hotel, etc.	100 kg
Animal Feed Project	Animal Feeds	Village Farms	250 kg
Meat Processing Project	Smoked meat	Shop Villagers	100 kg
Bone Crushing Project	Bone Powder	Feed Factory Villag	150 kg
Animal Cooking Oil Pro- ject	Cooking Oil	Shops Villagers	100 kg
Charcoal Making Project	Charcoal	Villagers Shops, Factories	200 kg
Wood Toys and Educational Material Project	Educational	Schools	30 sets
Wheelbarrow Project	Wheelbarrow	Villagers, Shops	5 units
Roof Tile Project	Roof Tiles Bricks	Villagers	600 pcs.
Gem Stone Project	Polished G. Stone	Export	-
Natural Brick Project	Natural Stone Brick	Export Home Market	165 pcs.
Scrap Metal Treatment Project	Sorted Scrap Metal	Factories	1 t
Tailoring Project	Uniforms Working Wear	Offices Schools	60 units
Knitting Project	Pull-over Sweater	Highland People	9 units
Bicycle Saddle Project	Leather Saddle	N.B.C in Dar	100 pcs.
Oval Briquette Project	Briquette	Villagers	1,500 pcs.
Oil Revitalization Pro- ject	Revitalized oil	Petro Station Car- Users	200 lit.
Potato and Starch Project	Starch	Shops	180 kg

Implementation Possibility Test (Table-36c)

Industrial project	Equipment	Obtainable	Cost	Life	Skill required	Education background	Emplo
Trucking Project	8 trucks	Import	700,000/=	5 years	Medium	SVII - FII	
Stone Crushing Project	1 stone crushing 1 Digging Machine	Import	260,000/=	8 years	High and Medium	SVII - FIV	
Foundry Project	1 Cupola	Import and Local made	35,000/=	10 years	Medium	SVII - FIV	
Forging Project	1 Kiln and 2 Forging Machines	Import	75,000/=	10 years	High and Medium	SVII - FIV	
Oil Extraction	1 Squashing Machine and Filter	Import	42,000/=	10 years	Medium	SVII - FIV	
Tomato Puree Project	1 Squashing Machine and Filtering "	Import	30,000/=	10 years	Medium	SVII - FIV	
Jam and Marmalade Project	2-3 pans and Filters	Local Made	10,000/=	5 years	Low	SVII - FII	
Animal Feed Project	1 milling Machine	Import	20,000/=	5 years	Medium to Law	SVII - FII	
Meat Processing Project	1 Smoking Unit	Local Made	7,000/=	3 years	Law	SVII - FII	
Bone Crushing Project	1 Crushing Machine	Import	25,000/=	5 years	Law	SVII - FII	
Animal Cooking Oil Project	Pans and Tins	Local Made	3,000/=	5 years	Law	SVII - FII	
Charcoal Making Project	1 kiln	Local	3,000/=	1 year	Medium	SVII - FII	
Wood Toys and Edu- cational Material Project	5 Carpenter Sets	Import	5,000/=	3 years	Medium	SVII - FII	
Wheelbarrow Project	3 Carpenter Sets	Import	3,000/=	3 years	Medium	SVII - FII	
Roof Tile Project	1 kiln and Ocher	Local Made and Import	28,000/=	3 years	Medium	SVII - FII	
Gem Stone Projects	1 Cutting 1 Digging 1 Grinding	Import	50,000/=	5 years	High	FIV	
Natural Brick Project	2 Sets of Digging and Crushed Machine	Import	56,000/=	5 years	Medium	SVII - FII	Addit
Scrap Metal Treat- ment Project	1 sharing Machine 1 Truck (special order)	Import	125,000/=	5 years	Medium	SVII - FII	
Tailoring Project	Cutter, Sawing Machine, Irons, etc.	Import	42,000/=	4-5 years	Medium	SVII - FII	
Knitting Project	9 knitting Machine 1 Sawing Machine	Import	28,000/=	5 years	Medium	SVII - FII	
Bicycle Saddle Project	2 Pressing Machine	Import	50,000/=	8 years	Medium	SVII - FII	
Oval Briquette Project	1 milling Machine	Import	17,000/=	5 years	Law	SVII - FII	
Oil Revitalization Project	1 oil-Revitalization Machine, 1 Pick-up	Import	80,000/=	5 years	Law	SVII - FII	
Potato and Starch Project	1 Squashing Machine and Others	Import and Local Made	50,000/=	10 years	Law	SVII - FII	

Criteria to Choose Priority Projects (Table-37)

	Point 1	Point 2	Point 3
(a) Availability of Raw Materials	Available near production unit Large volume	Available within region Medium Vol.	Available within country or by import Low Vol.
(b) Availability of Sub-Materials	Available near production unit	Available within region	Available within country or by import
(c) Availability of Production Means	Self-made Low cost	Readily-Imported Goods Medium cost	Special order to foreign countries High cost
(d) Level of Skills & Technology	Low	Medium	High
(e) Expected Employment Effect	High	Medium	Low
(f) Demand for Products	High	Medium	Low
(g) Possibility of Import Substitution	High	Medium/Low	Nil
(h) Possibility of Exportation	High	Medium/Low	Nil
(i) Scale of Production	Possible at small scale	Possible at medium scale	Possible at large scale only
(j) Importance & Necessity with respect to Overall Industrial Dev.	High	Medium	Low

Priority Test (Table-38)

	1	3	5	6	7	8	9	10	12	13	14	17	18	19	20	21	26	28	29	38	39	41	
1. Availability of Raw materials	1	1	1	1	2	2	3	2	2	2	2	3	1	1	1	1	1	1	2	3	2	2	1
2. Availability of Sub-materials	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
3. Availability of Production means	3	2	3	3	3	3	1	3	2	1	2	1	1	2	2	1	3	3	3	3	2	3	3
4. Level of Skilled and Technology Required	1	2	2	2	2	2	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	1
5. Employment Effect	1	2	1	2	2	1	2	2	3	1	2	2	2	2	2	1	2	1	1	1	1	2	2
6. Demand for products	1	1	1	1	2	3	1	2	1	2	1	1	1	1	1	1	1	1	2	2	2	2	1
7. Possibility of Import Substitution	3	1	1	2	2	(2)	2	2	2	2	3	2	2	2	2	2	1	2	2	2	2	2	1
8. Possibility of Exploitation	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	2	3
9. Viable scale of Production	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
10. Basic ability of the Industry with respect to the industrial development	2	1	1	2	3	3	3	3	3	3	3	3	2	3	2	2	1	3	3	3	2	2	2
Total	18	16	16	20	20	22	20	20	20	19	20	19	17	19	18	16	17	21	22	20	17	18	18

Priority Ranking (Table-39)

Ranking	Total points	Industries
FIRST PRIORITY GROUP	16	1. Trucking Project 6. Forging Project 5. Foundry Project 21. Roof tile Project
SECOND PRIORITY GROUP	17	18. Charcoal making Project 26. Scrap Metal Treatment Project 39. Oval Briquette Project
THIRD PRIORITY GROUP	18	3. Stone Crushing Project 20. Wheelbarrow Project 41. Oil Revitalization Project
FOURTH PRIORITY GROUP	19	13. Meat Processing Project 17. Animal Cooking Oil Project 19. Wood Toys and Education Material Project
FIFTH PRIORITY GROUP	20	7. Oil Excavation Project 9. Jam and Marmalade Project 10. Animal Food Project 12. Potato and Starch Project 14. Bone Crushing Project 38. Bicycle Saddle Project
SIXTH PRIORITY GROUP	21 and 22	28. Tailoring Project 8. Tomato Puree Project 29. Knitting Project



Location Distribution of New Industries (Table-40)

	1st Year	2nd Year	3rd Year	4th Year	5th Year
Trucking Project	Moshi Town	Same, Sanya			
Stone Crushing	Rombo		East Mengwe (Tabeta Stones)	Moshi Town	Gonja, Usangi
Foundary Project	Moshi Town				Same
Forging Project	Moshi Town	Marangu		Same	Machame
Oil Extruction	Sanya Juu Moshi Town			Mkuu	Gonja, Usangi
Tomato Puree			Sanya Juu	East Vunjo	Usseri
Jam and marmalade		Moshi Town			Mshewa
Animal feeds Project		Sanya Juu	Kishiwani		Mashati
Potato and starch		East Masama		East Mengwe	Same
Meat Processing			Moshi Rural, Moshi Town, Kigare, East Machame South Mashati	Rembeni, South Masama, East Mengwe	Kilongwa, Central Siha, Tarakea
Bone Crushing			Moshi Town	East Machame, South Mashati, Kilongwe	
Animal Cooking Oil			Moshi Town	South Mashati	East Machame, Kilongwe
Charcoal making		Central Kibosho, East Uru, Muti, North Usseri	Vuje	Tarakea, West Masama	Kilongwe
Wood Toys and Educational Materials		Moshi Town	Same	Mkuu	Sanya Juu
Wheelbarrow Project		Central Kibosho		Mashati Olele	Ugweno, Same
Roof Tile Project		Usangi	Mengwe		East Machame
Gemstone Project					Bondera and Same
Natural Stone Brick Project	East Mengwe				
Scrap Metal Treat- ment Project	Moshi Town	Marangu		Same	Machame
Tailoring Project			Moshi Town	Same	Himo/Marangu Machame
Knitting Project			Kibololoni	North Uru	Tarakea
Bicycle Saddle Project				Moshi Town	

Investment Requirements for New Industrial Projects (Table-41)

(Unit: Shilling)

	1977/78	1978/79	1979/80	1980/81	1981/82
Number of Industrial Units of which Coops	6 (3)	18 (7)	15 (7)	24 (12)	33 (12)
Total Costs	F.C.P. (503,500)	Total Costs F.C.P. (506,850)	Total Costs F.C.P. (814,050)	Total Costs F.C.P. (842,900)	Total Costs F.C.P. (975,300)
	850,400	969,600	1,368,700	1,867,200	1,989,050
	(503,500)	(506,850)	(814,050)	(842,900)	(975,300)
TOTAL	850,400	1,820,000	3,188,700	5,055,900	7,044,750
	(503,500)	(1,010,350)	(1,824,400)	(2,667,300)	(3,642,600)
WORKING CAPITAL	595,850	599,350	623,540	628,440	652,660
	-	-	-	-	-
	1,014,950	1,018,450	1,058,530	1,077,550	1,077,550
	-	-	-	-	-
	3,036,900	3,036,900	3,036,900	3,170,160	3,170,160
	-	-	-	-	-
	3,502,650	3,502,650	3,502,650	3,506,150	3,506,150
	-	-	-	-	-
TOTAL	595,850	1,614,300	4,678,890	8,226,520	11,848,320
	-	-	-	-	-

FIXED CAPITAL

Working Capital Compared: Projected vs. Present (Table-42)

(Unit: Shilling)

	1977/78	1978/79	1979/80	1980/81	1981/82
PROJECTED	90,000/=	270,000/=	288,000/=	432,000/=	432,000/=
WORKING CAPITAL	(5 x 18,000)	(5 x 18,000)	(16 x 18,000)	(24 x 18,000)	(24 x 18,000)
PRESENT	74,481/=	126,868/=	379,612/=	437,813/=	430,224/=
WORKING CAPITAL	(595,850 - 12 x 1.5)	(1,014,950 - 12 x 1.5)	(3,036,900 - 12 x 1.5)	(3,502,650 - 12 x 1.5)	(3,441,800 - 12 x 1.5)
	74,481/20	126,868/75	437,813/25	430,224/95	430,224/95

Summary of Economic Analysis of Proposed Industries (Table-43)

(unit:shs.)

Name of Project	Initial investment	Annual total costs when operation starts	Economic rate of return (full capacity) %	Marketability (estimated yearly demand; mainly based on RTC sales values)	Resources (raw materials)
1. Trucking Project	895,250	386,257	576,000	21.2	Demand in terms of Transportation services is enormously high
2. Stone Crushing Project	287,160	255,523	372,000	40.6	1,600,000/- total output of 5 construction companies Stone reserves are found abundant along valleys and rivers of Rombo and Pare mountain areas.
3. Foundary Project	175,066	136,000	206,800	40.5	175,000/- with possibility of 500,000/- Abundant in the form of scrapmetals.
4. Forging Project	192,000	138,195	203,400	34.0	500,000/- of knife, Hoe, Paruga, Axe Abundant in the form of scrapmetals.
5. Oil Extraction Project (Cooking Vegetable Oil)	78,266	119,456	172,800	68.2	6,000,000/- with animal cooking oil (see) Cotton seed: Cotton production of Kilimanjaro in 1975/76 is 778 tons, of which approximately 2/3 or 500 tons account for cotton seed. As annual supply of cotton seed to an extraction unit is estimated at 50 tons, there would be enough amount of seed for about 10 processing units, provided that Same Oil Extraction Unit would not consume all cotton seed produced. Sunflower seed: Annual production of sunflower seed in 1975/76 is 78 tons. As a unit requires annual supply of 60 tons, present production level is recognized quite low. But it is expected that, as farmers become aware that seed is salable, they would increase its production.

Name of Project	Initial investment	Annual total costs when operation starts	Economic rate of return (full capacity)	Marketability (estimated yearly demand: mainly based on RTC sales values)	Resources (raw materials)
6. Tomato Puree Making Project	53,827	134,886	117.3	200,000/- Tomato Related Products	It is recorded that vegetables are harvested 3,000 tons in 1975/76, of which tomato production is estimated to share approximately 15% or 450 tons. As annual tomato consumption at each unit is estimated at 75 tons, there would not be much problem in supplying enough raw materials, provided that consumption of fresh tomato would not reach a high level.
7. Jam and Marmalade Making Project	39,938	103,736	130.8	200,000/-	Citrus and other fruits production is recorded at 650 tons. As one industrial unit needs annual supply of 24 tons, it seems that raw materials are sufficient even if consumption of fresh fruits is taken into account. In spite of the above fact, production of strawberry and apple, which are most suitable for Jam, is at a quite low level at the present. It is hoped that a new production-diversification scheme will start in a couple of years time.
8. Animal Feeds Making Project	45,450	70,369	69.6	1,300,000/- supplied by National Milling Corporation	As raw materials, maize, maize husk and maize cog, rice bran and broken rice, wheat bran, bagasse, powdered bone and powdered animal blood can fully be utilized. Judging from the present production (1975/76) of maize (28,000 tons), wheat (6,581 tons), rice (4,200 tons), sugar and jaggery (49,703 tons), it would be quite possible to supply enough raw materials to proposed animal feeds projects. However, powdered bone and powdered blood would only be available when these projects start.
9. Potato and Other Starch Making Project	86,600	96,928	62.7	8,000,000/- of baking powder	Production of casava (dry) is 3,200 tons, that of Irish potato 9,500 tons and that of sweet potato 4,000 tons in 1975/76. Total production of these food crops would suffice for needs of raw materials to proposed industrial units.

Name of Project	Initial investment	Annual total costs when operation starts	Economic rate of return (full capacity) %	Marketability (estimated yearly demand: mainly based on RTC sales values)	Resources (raw materials)
10. Meat Processing Project (Smoked Meat)	32,950	323,279	475.7	1,000,000/- and over depending on the taste of local population	Livestock resources of Kilimanjaro in 1975/76 are; Cattle 751,933 heads, Goat 192,810 heads, Sheep 99,211 heads, Pig 12,300 heads. These figures would prove that the meat processing project, the bone crushing project and the animal cooking oil project can obtain enough raw materials from various slaughter-houses.
11. Bone Crushing Project (Powdered Bone)	51,050	72,196	70.1	100,000/- with an expectation of increase in demand	Even under the envisaged shortage of timber for charcoal making, it would be possible if the charcoal making unit utilizes waste-timber which is abundant at most saw-mills of the region.
12. Animal Cooking Oil Making Project	28,827	110,508	199.5	6,000,000/- with Briquette Project	Abundant for the demand
13. Charcoal Making Project	11,727	38,704	161.2	349,440/- with Briquette Project	Abundant
14. Wooden Toys and Educational Materials Making Project	46,916	118,692	130.7	170,000/- 2 sets per classroom for all the Primary Schools.	Abundant
15. Wheel Borrow Making Project	37,177	132,887	159.0	200,000/- by RTC and TFA	Abundant
16. Roof Tile and Other Making Project (Roof Tile) Brick, Claypipe	36,727	78,135	100.9	16,000,000/- in terms of G/S	Abundant
17. Scrapmetal Treatment Project (50 Red Scrapmetal)	131,172	191,145	64.7	1,312,000/- in terms of steel imported	Abundant all over the Region
18. Tailoring Project (School Uniform, Other Uniform)	103,116	366,640	203.1	2,000,000/- 2 pair per school boy or girl	Abundant from textile mills
19. Knitting Project (Knitted Wear)	86,950	338,209	170.0	120,000/- this is the figure RTC deals with. Far more demand is recognized at many shops in the Region	If wool, all have to be imported

Name of Project	Initial investment	Annual total costs when operation starts	Economic rate of return (full capacity) %	Marketability (estimated yearly demand: mainly based on RTC sales values)	Resources (raw materials)
20. Bicycle Saddle Making Project (Bicycle Saddle)	90,172	363,216	182.7	1,000,000/- Present sales of bicycle by RTC.	Just like the above case (the meat processing, the bone crushing and the animal cooking oil), it would be quite possible to secure enough raw materials provided that these industries are well coordinated
21. Saw Dust Briquette Making Project	25,616	51,420	122.5	349,440/- with charcoal Project	As raw materials, saw dust and coffee husk are considered. Both of them are abundantly recognized though their volume has not been compiled, and are often a stumbling-block for productive activities of factories and mills concerned
22. Oil-Revitalization Project (Revitalized Oil)	103,821	79,784	38.7	Over 500,000/- would be expected for industrial purposes	Abundant at petro-station and factories.
23. Natural Stone Brick Making Project (Stone Brick)	55,555	120,901	138.8	Demand for stone bricks as well as cement bricks are very high. A few million shillings of demand would be expected	Abundant Report
24. Gemstone Polishing Project (Polished Gemstone)	68,100	134,832	113.2	500,000/- to 1,000,000/- be easily provided that production can cope with the demand	Not investigated yet, but believed to be enough for the demand

### 9.3 Programme No. 2 : General Industrial Promotion Programme

#### Project 1. Kilimanjaro Industrial Development Center (KIDC)

##### (1) Objectives

The proposed Kilimanjaro Industrial Development Centre is designated as a pivot of industrial development in Kilimanjaro. It will play a central role in intensifying efforts for industrial development and will be the core of a package approach to industrial development. In this sense, the Kilimanjaro Industrial Development Centre is expected to have a major impact on the industrial growth of the region and trigger sustained industrial growth.

Thus, the activities of the proposed KIDC will in many ways promote industrial development in the region. The objectives of the KIDC can be divided into primary objectives and overall objectives, and the former can be further classified into two categories, that is, improvement of the present situation and preparation for future industrial development.

##### (2) Primary Objectives

- (i) Guidance and dissemination of production and managerial technology: This includes general technical advice and help in improvement of use of machinery and equipment and in better management and accounting methods for the purpose of raising the general technological level.
- (ii) Development and introduction of intermediate technology appropriate to local situation: The KIDC will develop production technology appropriate to local resources and recycle specific resources which are scarce in this country, such as fuel and metals.

- (iii) Particular need to raise level of operation: The situation in the region in this respect is quite serious. The main causes are inadequate skill levels, improper maintenance, nonavailability of repair services, and lack of spare parts. The KIDC will attack these problems from all angles.
- (iv) Introduction and encouragement of new industries: The KIDC will conduct feasibility studies, set up pilot machinery, and test the manufacture of new products.
- (v) Special encouragement of basic industries: The KIDC will emphasize installation of pilot production facilities in basic industries such as forging, foundries, metal processing, and ceramics. This will be a vigorous attempt to develop basic industries on a small scale or the village level.
- (vi) Intensification of industrial linkage: In order to intensify industrial relationships, the KIDC will provide special technical guidance for small industries to become suppliers for large industries and to encourage large industries to place outside orders.
- (vii) Intensive guidance of village industries: Since village industries are essential to the realization of Tanzanian socialism, the KIDC will endeavour to offer intensive guidance in production and managerial skills to rural industries which are based on rural markets and local resources.
- (viii) Manpower training: To mitigate the skilled manpower shortage, the KIDC will conduct short-time training in specific skills.



- (ix) Commercialization and sales promotion of products of village and small industries: Since marketing opportunities and routes are not available to these industries, the KIDC will provide merchandising guidance and places for product displays as well as some channels of operation for distribution.
- (x) Collection and dissemination of industrial information: For overall industrial development, the KIDC will gather industrial information and undertake basic periodical surveys, some of which will be useful for negotiations and guarantees from financial institutions.

### (3) Overall Objectives

- (i) Overall improvement and development of production, management, and marketing skills of industries in the region.
- (ii) Enhancement of industrial employment and increase in income through expansion of the industrial sector.
- (iii) Transformation and strengthening of the industrial structure of the region: transformation from a structure based on simple consumer goods and industries processing primary products to a firm and integrated industrial structure including basic industries.
- (iv) Achievement of Tanzanian Ujamaa Socialism through encouragement of rural industries and cooperative movements.

### (4) Activities and Benefits

#### (i) General extension services

##### (a) Managerial and marketing guidance

In order to cope with poor management, improper pricing, lack of skill in purchase of materials, and poor

merchandising, the KIDC will provide a wide scope of management and marketing guidance to industrialists.

**Management techniques:** To provide existing industries in the region with management concepts and techniques covering quantitative control, inventory control, optimum costs, etc.

**Marketing guidance:** Since there is no well organized marketing system in the region, there is a need for some kind of arrangement for promoting product sales. Also, sales of products of individual enterprises and cooperatives will be promoted through product design services, a market information service, marketing research, etc.

The providing of these services will promote competition and reduce the incidence of surpluses of unsaleable goods.

- (b) **Engineering guidance:** The majority of industries in the region face machine troubles, lack of spare parts, and vehicle breakdowns which on the one hand, result in underutilization of machinery, low productivity, and inferior quality of products and, on the other hand, increase the amount of spare parts that have to be imported. To overcome these problems, a maintenance and regular checkup system, repair services, and manufacturing of spare parts should be established. In this respect, the KIDC will provide mobile maintenance guidance, repair services, and processing of some spare parts. Of course, spare parts processing will be done in KIDC workshops.

The benefits will be immense and far-reaching in terms of strengthening production capacity (and reducing underutilization of capacity), improving production

technology, encouraging engineering industries, and reducing imports.

(ii) Workshops services

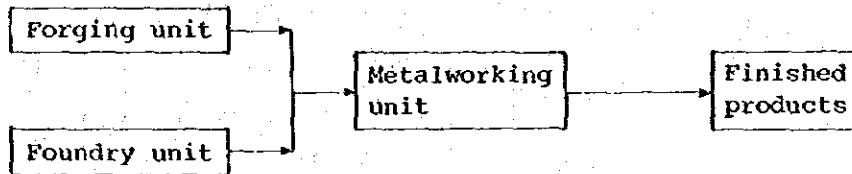
Aims

- (a) Repair services and spare parts manufacturing on order.
- (b) Establishing and publicizing pilot plants in promising industries and test manufacturing of promising new products.
- (c) Development of new and appropriate technology, including recycling of waste materials.
- (d) Analysis and examination of the nature and quality of materials and products after completion of their manufacture.

Workshops

Installation of a forging unit, foundry unit, metalworking unit and ceramic unit, all of which are essential for industrial development.

A forging unit combined with heat treatment is a facility for machine repair and spare parts processing. Also, a metalworking unit for cutting, pressing, grinding, fitting, and finishing is vital for machine repair, especially repair of assembling machines. Furthermore, a forging unit is important for the development of agricultural implements and cultery goods. Also, this unit will greatly contribute to rural development by upgrading the work of village blacksmiths.



A foundry unit is also basic for both existing and future industries. It can produce gears, which are desperately needed in the region. For future industries it can provide accessories, kitchen wares, pumps and building materials.

The ceramic/pottery unit will provide extension services for small existing rural potters and burnt brick makers, whose techniques are still rudimentary but whose numbers are great. Their future potential in items ranging from tableware to producer goods is very high. Initially, the industry can produce pottery, burnt bricks, clay pipes for irrigation, and roofing tiles--all of which are already technically feasible.

First, a good-quality kiln must be established to serve potters located throughout the region and improve their product quality. Subsequently, additional kilns can be built in appropriate villages. At the same time, potter's wheels should be provided local potters.

In the future, the ceramic industry could evolve to the stage of building tiles, refractories, and insulators with advancement of technology and clay quality. Attention should also be paid to art wares for tourists who come to Mt. Kilimanjaro and the Mkomazi Game Reserve as an effective means of earning foreign exchange.

Needless to say, clay analyses should be conducted by an examination unit because it is not yet known which areas have the best clays.

(iii) Manpower training services

The shortage of skilled manpower in the region is serious. Especially lacking are advanced practical technicians. The supply of skilled manpower simply does not meet demand.

The KIDC will focus on retraining and upgrading of semi-skilled factory personnel. At the same time, it will upgrade training and teaching personnel at institutions for training in basic skills. Training will be intensive, most courses lasting about ten days. Furthermore, the subjects covered will be practical and technically specialized as follows.

- Maintenance and repairing techniques
- Metal cutting
- Welding
- Heat treatment
- Forging
- Pottery wheel operation
- Cost estimation
- Product design, etc.

As for training lecturers, some could be invited from overseas to augment resident experts.

(iv) Research and planning service

This service will include collecting and compiling information for further industrial development. For example, one of the tasks is to compile a "Guidebook for Kilimanjaro Industries" to identify further investment opportunities. Also, this service will help industrialists get financing from banks by providing helpful data. Another task is to undertake various feasibility studies for new projects.

(v) Sales promotion services: Moshi Industrial Exhibition Unit

Since marketing is a major difficulty of industries in the region, it is recommended that the KIDC manage an urban marketing centre. This Industrial Exhibition Unit will be situated in the centre of Moshi at a different location from the KIDC headquarters.

It will be quite effective for village and small industries in terms of advertising and selling products since the rural marketing system is not well organized yet.

Although village industries and district industries should be basically oriented to local markets, some products should be basically oriented to local markets, some products should seek additional markets elsewhere, especially in Moshi. The urban marketing centre will be helpful in exhibiting these products.

It can also be of immediate use for tourist display of handicraft products of village industries. Many such products could certainly be sold on the spot.

The reason why such a center should be managed by the KIDC is that this is in line with its function of providing marketing guidance.

(vi) Rural industry promotion services

This project is included in Programme 3 - Rural Industries Development Programme. It includes two rural industry promotion stations and will greatly contribute to rural industrial development through fast service. In the first phase, stations will be established in Pare and Rombo.

### Components of Industrial Growth Centres

Industrial Growth Centres	Technical Centres	Production Centres
Regional industrial growth centre	KIDC	Moshi Industrial Estate
District and village industrial growth centres	KIDC rural industrial promotion stations, Rural Training Centres, etc.	SIDO industrial workshops

These "rural industrial growth centres" are to be composed of technical and production units, together with SIDO industrial workshops and rural training centres.

The strategic importance of the project in terms of rural development is explained in Programme 3, and the detailed investment cost estimates and site plans are described here.

#### (5) Organization, Staff, and Facilities

The KIDC will consist of an Advisory Committee and three departments.

The Advisory Committee will be formed by the Regional Development Director, District Development Directors, the Small Industrial Promotion Officer (SIDO), the Manager of Kilimanjaro Regional Trading Company, Managers of District Development Corporations, the Director of the KIDC, and others. The Committee is expected to meet quarterly under the chairmanship of the RDD and will advise on KIDC activities.

The Appropriate Technology Development Department will be responsible for engineering aspects of the workshops and for introduction and improvement of technology in the pilot plants.

The Extension Service Department will be responsible for technical guidance and promotion of wider use of technology in the areas of management, marketing, and engineering. Also, it will supervise the Pare and Rombo Industrial Promotion Stations and the Moshi Industrial Exhibition Unit.

The Programming and Coordination Department will be in charge of programming, research, feasibility studies, coordination and general affairs.

**Staff:**

The total requirement is 89 staff members: a director, 79 local staff members, and 9 advisers.

**Facilities:**

The KIDC will consist of five major sections: foundry, forge, mechanical engineering, ceramics, and briquettes.

**(6) Financial Requirements and Sources**

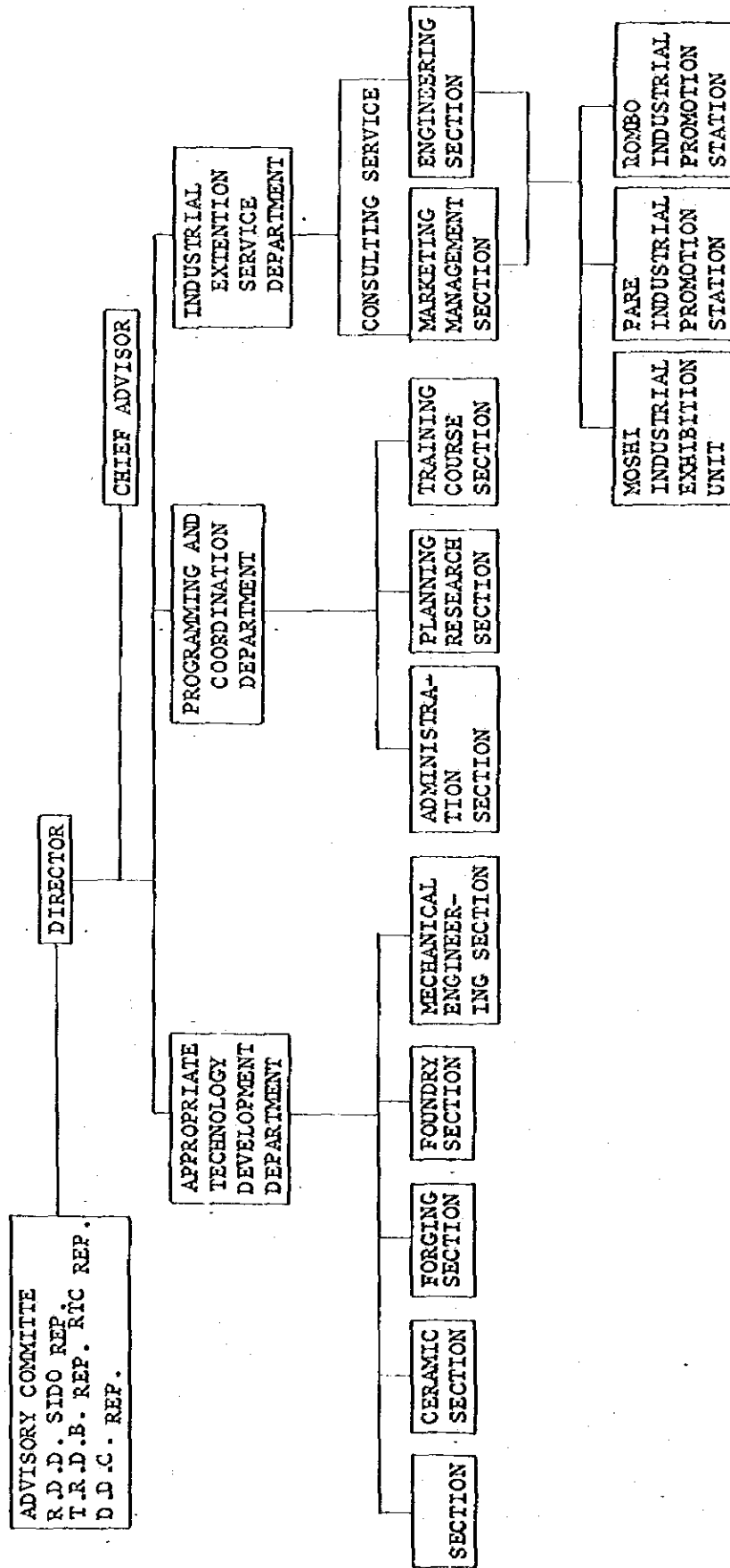
The total initial investment cost of the KIDC will be approximately 10,157,000 shs., of which about 46% is expected to be provided in the form of foreign exchange. Annual running cost will average about 953,764 shs., exclusive of depreciation and interest costs. The detailed figures are shown in Table 45.

**(7) Implementation by Phases**

In view of the problems of manpower and financial and physical resources, this project will be implemented in phases. As indicated in Table 46, the duration of the project is five years. The major part of the project will be completed within the first two or three years.



Organization Chart of the KIDC (Fig. -4)



Organization, Staff and Facilities (Table - 44)

Organization/Location	Staff		Facilities
	Director	Local Staff Total	
(1) Headquarters (Moshi)	1	64	74
Control Centre (Incl. Advisory Committee)	1	2	4
Programming Coordination Dept.	1	20	21
Administration Section	1	10	11
Planning/Research Section		5	5
Training Course Section		5	5
Extension Service Department	1	14	15
Marketing/Management Section	1	9	10
Engineering Section		5	5
Appropriate Technology Development Department	6	28	34
Foundry Section	2	5	7
Forging Section	1	5	6
Mechanical Engineering Section	1	10	11
Ceramic Section	1	5	6
Briquette Section	1	3	4
(2) Moshi Industrial Exhibition Unit		7	7
(3) Pare Industrial Promotion Station		4	4
(4) Rombo Industrial Promotion Station		4	4
Total	1	79	89

Cost Estimate of the Proposed Kilimanjaro Industrial Development Centre (Table-45)

	Project Year					Total		
	1st Year	2nd Year	3rd Year	4th Year	5th Year	Total Cost	Foreign Currency	Local Currency
<u>Equipment Investment</u>								
Building and Shed	2,697,340	842,905	570,375	277,565	175,350	4,563,535		4,563,535
Machinery	627,287	2,908,811	368,075	203,625	70,573	4,178,371	(4,167,799)	10,573
(Foreign Currency)	(627,287)	(2,908,811)	(368,075)	(203,625)	(60,000)	(4,167,798)		
Machinery Installation Cost	32,443	285,167	31,094	14,649	7,054	370,407		370,407
Office Equipment	171,250	44,000	15,300	10,500	3,300	244,350	89,500	156,850
(Foreign Currency)	(55,500)	(18,000)	(7,000)	(7,000)		(87,500)		
Infrastructure	747,064	27,368	27,368			801,800	400,000	401,800
(Foreign Currency)	(400,000)					(400,000)		
Sub-Total	4,275,384	4,108,251	1,012,212	506,339	256,277	10,158,463	4,655,298	5,503,165
(Foreign Currency)	(1,082,787)	(2,926,811)	(375,075)	(210,625)	(60,000)	(4,655,298)		
<u>Operational Costs</u>								
Salaries and Wages	131,700	385,080	508,692	568,368	615,540	2,209,380		2,209,380
Staffing: Local Staff	27	57	68	75	78			
Advisor	6	8	8	9	8			
Maintenance Cost	4,544	31,650	96,430	110,705	121,365	364,694		364,694
Raw Materials & Utilities	-	314,531	391,207	452,722	475,362	1,633,822	-	1,633,822
Office Supplies etc.	34,870	92,828	125,848	144,755	162,620	560,921		560,921
Sub-Total	171,114	824,089	1,122,177	1,276,550	1,374,837	4,768,817		4,768,817
Total	4,446,498	4,932,340	2,134,389	1,782,889	1,631,164	14,927,280	4,655,298	10,271,982
(Foreign Currency)	(1,082,787)	(2,926,811)	(375,075)	(210,625)	(60,000)	(4,655,298)		

	1st Year	2nd Year	3rd Year	4th Year	5th Year
<b>(1) Programme Coordination Dept.</b>					
(a) Administration Section					
(b) Planning & Research Section	Possibility Study Industrial Survey	"	"	"	"
(c) Training Course Section	Counterpart Training	Mechanical Engineering (Grade A & Manpower B)	Engineering Standard (A)	Metal Materials (A-B)	All previous course
		Mechanical Drawing (A)	Precision Measurements (A-B)		
		Process Control (A)			
<b>(2) Extension Service Dept.</b>					
(a) Marketing & Management Section	Counterpart Training	Cost Control Product Design Control	Inventory Control	All previous courses	"
(b) Engineering Section		Maintenance Control	Training Service	All previous course	"
		Repairing Service			
<b>(3) Industrial Promotion Dept.</b>					
(a) Mechanical Engineering Section	Counterpart Training	Machine Training (A-B)	Precision Measurements (A-B)	All previous course	"
(b) Foundry Section	Counterpart Training	Spare Parts Manufacturing	Dissolution (B)	All previous course	"
		Wood Patterns (B)			
(c) Forging Section	Counterpart Training	Spare Parts Manufacturing	Forging (B)	Heat Treatment All previous course	"
		Spare Parts Manufacturing			
(d) Ceramic Section		Counterpart Training	Pot-Making Burnt Bricks	Irrigation Pipe Roofing Tiles	Table wares Floor Tiles

### 9.3 Project 2. : Moshi Industrial Estate

#### (1) Introduction

Originally the Moshi Industrial Estate Project was independently proposed by both the regional office of Kilimanjaro and the regional office of SIDO. Hence, it is not treated here as a project of the present IRDP. However, it is so relevant for industrial development of the region that we shall discuss its role here in relation to the industrial planning of the IRDP.

#### (i) General Background

##### (a) Effects of Industrial Estate of Development

The development effects of the industrial estate will be many including transfer effect, complementarity effects, common facilities effect, and information exchange effect.

A transfer effect is created by geographically shifting an industrial unit from a presently unfavourable place to a more favourable estate. This is especially relevant in prevention of environmental pollution.

The second effect is the complementarity effect, which is the most important industrial estate benefit.

A good example is the machine industry, which needs a variety of spare parts. If these industrial units gather in one place, they can share many benefits with one another by providing each other necessary parts.

Common facilities are popular in developing countries. Industrial development needs a lot of overhead capital, which is a great burden for an individual industry. If some plural industrial unit can offer joint-use facilities with an industrial estate approach, it is very economical.

The fourth effect is information dissemination. Industries gathered in one place can exchange technical and market information and can raise their own level. Naturally, the important consideration for establishment of an industrial estate is to maximize these various effects.

(b) Location of the Industrial Estate

Industrial estates can also be divided into several types, depending on location. In this regard, the Moshi Estate because of its geographical location can be classified as a "hinterland" estate. Generally, hinterland estates have problems in terms of transportation, particularly of imported materials. Considering these problems, the following policies are recommended for the Moshi Industrial Estate:

- Higher stage of processing
- Dependence on local materials
- Marketing of heavy or bulky products on local markets
- Linkage with existing industries
- Maximization of the complementarity effect through use of common facilities

(ii) The Proposed Moshi Industrial Estate

The Moshi Industrial Estate Project's major objectives are as follows: (a) to provide good accommodations for industry transfer effect, (b) to provide infrastructural facilities (common facilities effect), (c) to improve financial credit ratings (common facilities effect), and (d) to spread technology (information exchange effect).

(a) Common Facilities Service

The major emphasis of the SIDO Estate is placed on the common facilities effect, particularly on infrastructure utilization, which seems to be appropriate in the regional context.

Generally, common service covers many items ranging from physical to nonphysical services, including the following.

\* Common Physical Services

Production Line

- Common utilization of a similar production process
- Common use of machine maintenance and testing facilities for materials
- Joint production of materials in common use
- Joint disposal of industrial wastes

Non-Production Line

- Joint storage facilities
- Joint transportation facilities
- Joint training of workers
- Medical facilities
- Entertainment facilities
- Commuter bus service
- Administrative offices

\* Common Non-Physical Services

Production Line

- Joint purchase of raw materials
- Joint sale of finished products

It is a matter of course that an industrial estate project should fully maximize the advantages of the industrial estate establishment.

(b) Industrial Complementarity

The selection of industrial units in the Estate by SIDO favors light metal industries. This approach is appropriate when considering the problems faced in the region and the geographical position of Moshi, which is situated inland. Also, in selecting types of industries, the principle of complementarity is taken fully into account. In the context of the development of Kilimanjaro industries, complementarity should be stressed more than competitiveness.

While the gathering of the same kind of industries causes excessive competition among member firms, a complementary type estate will encourage specialization and an efficient use of scarce resources.

The selected industries are shown in terms of technical linkage in Fig. 1. It is evident that even in the present project there is great complementarity. In an attempt to intensify this complementarity, press and sheet metal processing may be supplemented to increase considerably the kinds of finished products possible.



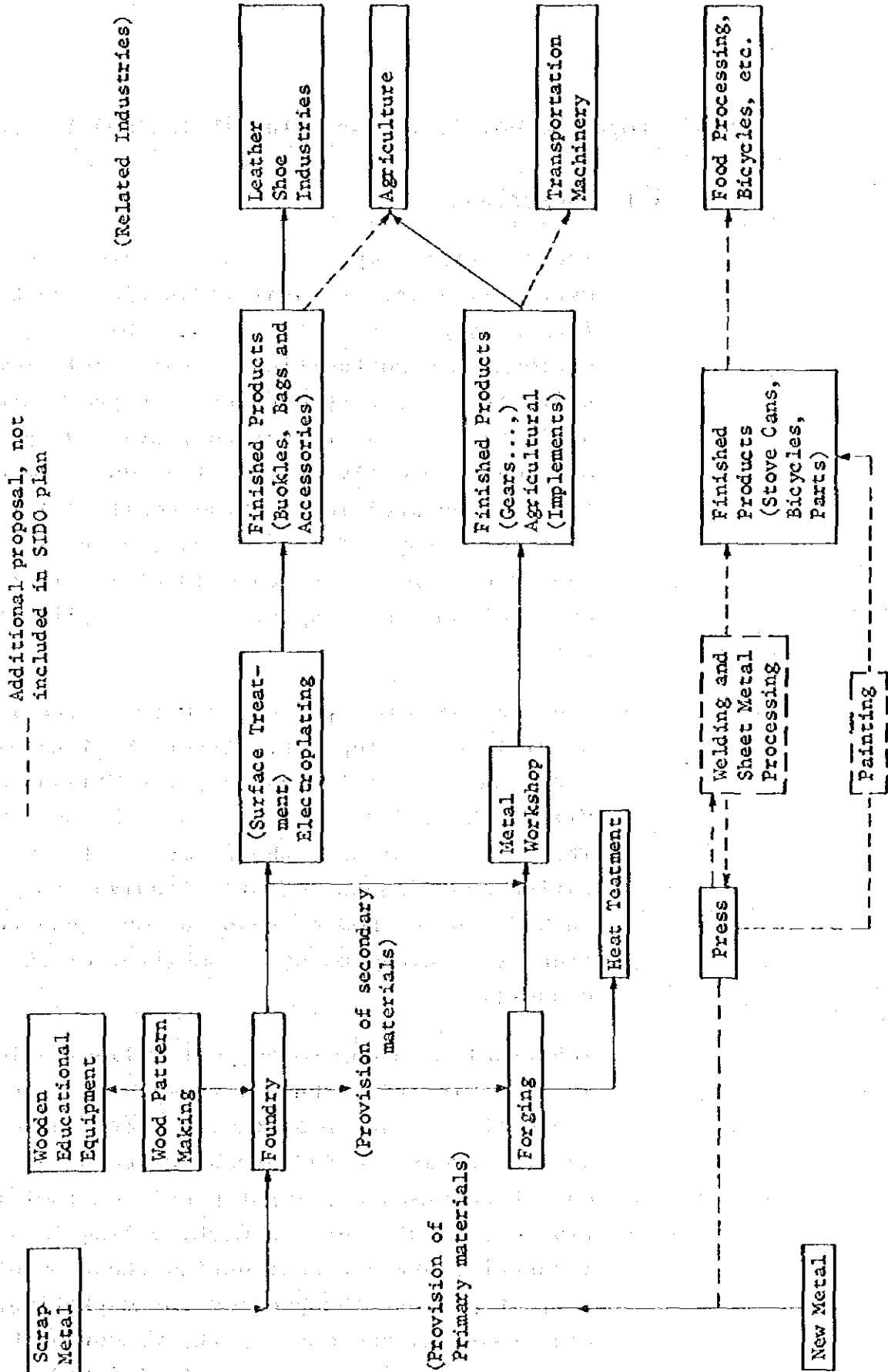
(iii) Relation Between Moshi Industrial Estate and Kilimanjaro Industrial Development Center

It is evident that the proposed industrial estate will assume an important role in encouraging future industrial development, particularly in the metal and engineering industries.

However, there are many physical and financial resources lacking. As already discussed, the technological problem is the most serious impediment on future development. The metal and engineering industries proposed in the industrial estate, in particular, will require a higher level of technology. Further, joint production processes will need common technical standards and terms.

In order to encourage and to complete the proposed industrial estate, an intensive technological development policy is required. Thus, it is proposed that the Moshi Industrial Estate Project be carried out in conjunction with the Kilimanjaro Industrial Development Center or that the latter be followed by the former. After technical conditions are improved and coordinated, a new industrial horizon will be opened.

Industrial Linkage of First Priority Industries by SIDO (Fig.-5)



#### 9.4 Programme No. 3. : Rural Industrial Development Programme

##### (1) Background

The strategic importance of the promotion and development of village or rural industries can be appreciated from many angles: They are capable of generating employment opportunities at relatively low capital cost; they are very effective in processing locally available raw materials; they are a very good means of providing daily essential goods to local people; they are helpful in creating additional income opportunities; they diffuse income over rural areas; and they can help to encourage local initiative, Ujamaa cooperation, and a spirit of self-reliance in rural areas.

The Tanzanian Government is placing special emphasis on village development. After the long historical experience of villagization, the Village and Ujamaa Village Act, 1975, was presented before the people. This act established the framework for village organization and orientation of villagization programmes. In terms of economic organization, industrial activities are decided on by a committee of the village council.

The problem is how to support villagization programmes in economic and technical terms. In order to encourage cooperative industries in villages, various kinds of activities are needed, such as technical guidance, marketing guidance, input provision facilities, and finance assistance. In fact, village and cooperative industries are now confronting these problems. Above all, at present the problems of marketing, physical distribution, and spare parts procurement are crucial to the quality and pricing of finished products.

In these areas rural/village industries expect to be helped by the government through well formulated programmes. In view of the related shortages of resources and of availability of physical and administrative infrastructure, it is recommended that a package programme for development of rural/village industries be formulated.

The package approach should include the following elements:

- (i) Credit and finance system
- (ii) Merchandising and marketing of finished products
- (iii) Improvement of physical distribution system
- (iv) Supply of raw materials
- (v) Technical guidance with respect to production equipment and maintenance systems and provision of repair services

(i) It is very difficult for village industries to secure loans from existing banking institutions because of such constraints as lack of proper guarantees and relatively high interest rates. In this regard, some special credit schemes are required.

(ii) These two problems are considered one of the most serious impediments to development of village industries at present.

They naturally cause market difficulties and surpluses of unsaleable products which eventually lead to closings. However, this area needs much specialized and professional knowledge, including market research and advice on product design. This is even more true when one realizes that village industries have to rely on a rural market network not at all well organized at present. Under

existing organization, the SIDO regional office has an important role in this area, but it is expected that in the future the RTC will also have an important role. Furthermore, these systems should be linked with the traditional market system.

- (iii) This area includes transportation and storage problems. In the Kilimanjaro Region the shortage of transportation facilities is extremely serious. Considering the geographical situation, motor vehicles are an important factor in the delivery of finished products and the procurement of raw materials. In addition, what is to be stressed here is a system of periodical maintenance of motor vehicles for reduction of frequency of breakdowns. This question deserves more attention. In addition to maintenance and checkup systems, a trucking system is needed in rural areas.
- (iv) At present, the RTC of Kilimanjaro accounts for 95% of the raw materials supplied to village industries. However, since the basic problem in this area is a rather limited financial capability, this is more properly a matter relating to the credit and finance system.
- (v) Village factories are all faced to a greater or lesser extent with the problem of underutilization of machinery and equipment. The causes are many, especially significant being difficulties of procurement of spare parts and machine breakdowns. A system of regular checkups and a maintenance system for machinery are absolutely essential, just as health control is to the human body. If maintenance is not regularly performed on machines, they easily break down and then need extra parts. At present it is difficult to get prompt repair service, and the result is underutilization of machinery.

In order to extend a periodical checkup system to industries and to provide them prompt repairing service, some technician cadres or organizations are required in addition to the existing system centering on the regional Ujamaa and cooperative officer.

Marketing, a physical distribution system, a supply system, and a technical extension services will be provided as a package by the "Rural Industrial Promotion Stations" of the proposed Kilimanjaro Industrial Development Center.

In addition, for financial problems we propose a guarantee and lending scheme for small industries.

(2) Project 1. : Rural Industrial Promotion Stations

The stations will be established centrally in the Pare and Rombo districts because these districts are remote from the headquarters of the proposed Kilimanjaro Industrial Development Center in both economic and geographical terms. They will provide package industrial services such as marketing, physical distribution, supply, and technical guidance. Their main functions, to be carried out in close association with KIDC headquarters, will be as follows:

Marketing services: In order to demonstrate the products of village industries, the stations will be equipped with showrooms. A Marketing Officer who works here will collect market information from various sources and provide it to village industries. In view of the local market orientation of these industries, such a function will be very useful.

**Physical Distribution Improvement:** Since the biggest problem in this area is transportation facilities, vehicles must be procured. Therefore, the installation of a shed for them is recommended. The vehicle will be used to deliver finished products and to carry raw materials. Another facility to be included with the station is a storeroom for finished products and raw materials.

**Repair Service:** Since village industries cannot readily get repair services, machinery and equipment remain idle for long periods and production declines. A repair section will therefore be attached to the station. A technical expert stationed here will inspect village industries to advise on machinery repairs and to provide maintenance guidance. The repair section will have simple machinery and tools. Since the stations will be under the control of the proposed KIDC, such repair sections will work in close association with headquarters.

However, in view of financial and physical resource constraints, it is recommended that this project be implemented in phases. A detailed explanation of this project will be given in Programme No. 2, Project 1.

(3) Project 2. : Leasing and Guarantee Scheme

(i) Leasing & Guarantee Scheme for Small-scale Industries

The establishment of a Kilimanjaro Leasing Company (KLS) and a guarantee institution for small-scale industries under the direction of TIB using a special RIB "6 Million Fund" for small-scale industry will be proposed.

(ii) Rationalization of the Project

(a) Background and need for the project

In Chapter 5 we have already noted that the main problem of development of village industries in Kilimanjaro is financing. Village industries lack management capability and collateral, and the banking system itself lacks funds and lending capability. Of course, these problems might be overcome within the present system if NBC and TRDB were to be considerably strengthened and/or if there were an eventual upgrading of managerial skills. But unfortunately these things are unlikely, and the problem is acute.

Fortunately, there is a five-year-old fund (6 million Tshs) in TIB for the promotion of small-scale industry which has not been utilized yet. The fund should be used as efficiently and as fruitfully as possible.

Since small industries suffer from a lack of collateral, we recommend that TIB establish a guarantee institution using that fund. If the fund is managed carefully, the maximum limit which TIB can guarantee will be ten times the amount that they have--i.e., 60 million Tsh.--which will be enough to cover loans for the whole nation's small-scale industrial establishments for the time being.

SIDO should be considerably strengthened with respect to management capability and as well and have control over the issuance of guarantees so that its incentive to organize and develop industry is strengthened.

A Kilimanjaro Leasing Company (KLC) is needed since it can function (1) as a financing intermediary using RTC facilities and borrowing NBC and TRDB funds in bulk for small loans to individual industrial units and (2) as a technical assistance agency for KIDC.



(b) Merits of this scheme

The following are the merits of the scheme:

- A previously unutilized fund will be put to good advantage for bank loan guarantees.
- Many institutions which so far have been separately assisting small-scale industries will be coordinated by KLC.
- This system is socialist in nature. The means of production will be owned by the government through the KLC, and at the same time the system provides an incentive for increase of productivity by charging a leasing fee to users, i.e., small-scale industries.

(c) Concluding remarks and further suggestions

This scheme is formulated under the following fundamental assumptions:

- SIDO in Kilimanjaro will be strengthened in terms of ability and staff.
- All institutions relating to this scheme, i.e., TTB, NBC, TRADE, RTC, and KIDC, will cooperate in establishing KLC.
- Market channels and merchandising assistance will be provided small-scale industries for greater realization of their business potential.

The project can not succeed unless it is carefully coordinated with the other projects proposed.

#### 9.5 Programme No. 4, Long-term Industrial Development Programme

The proposed programmes and projects are confined to the coming five years. A span of five years is not enough to change the surrounding conditions and impediments, including infrastructure. The proposed projects have therefore been selected with this limitation in mind, and this being the case, they are generally ambitious large-scale projects.

Over a longer period the following ambitious projects would also be possible.

(Table-47)

Projects	Location	Materials	Market	Present constraints
Sisal Paper Making	Pare	Sisal	General	Power, water
Sisal Textiles	"	"	"	"
Bagasse paper	-	Bagasse	"	Water, Bagasse
Chipboard	-	Sawdust	"	Market
Chips for pulp	-		"	
Gypsum Board	Pare	Gypsum	"	Power
Gypsum Processing	"	"	"	"
Can Making	-	-	"	Metal sheeting
Cement	Pare	-	Local	Power

## 9.6 Manpower Requirement

### (1) Classification of Industrial Manpower

Industrial manpower is classified into two categories "engineers" and "workers." The latter is further subdivided into four grades: "skilled workers," "semi-skilled workers," "non-skilled workers," and "non-production workers." Definitions are given in Table 48.

Manpower Classification (Table 38)

Manpower Grade	Necessary Ability	Qualification
Engineers	I Chief engineers or assistant engineers who undertake the following work:	University Graduates
	Professional Engineers (a) Planning of maintenance of machinery equipment and practical advice on maintenance. (b) Design and manufacturing of jigs. (c) R/D for new products and quality improvement.	(or junior college Graduates)
Workers	II Skilled Workers Foremen with more than five years of experience in particular production skills and capable of training semi-skilled workers.	
Workers	III Semi-skilled Workers Workers will more than three years of experience in particular production technology and capable of undertaking precision work under the supervision of a foreman.	
Workers	IV Non-skilled Workers Workers with less than three years of experience in a field of production and working together with semi-skilled workers under the supervision of a foreman.	
Workers	V Non-production Workers Workers without industrial production skills (watchmen, porters and messengers).	

The classification shown in Table 48 is not necessarily applicable to all existing and proposed new industries. For example, large-scale industries, which have more than 50 workers, often have the following system:

Status	Mechanical					Helper
	Engineer	Engineer	Technician	Foreman	Worker	
Grade	I	I	I	II	III	IV & V

On the other hand, manpower composition of small-scale industries is quite different from that of large-scale industries. That is, small-scale industries do not usually have any Grade I engineers and sometimes do not even have Grade II skilled workers.

Status	Engineer	Foreman	Worker	Helper
Grade (Case 1)	-	II	III	IV & V
Grade (Case 2)	-	-	III	IV & V

## (2) Present Conditions and Problems in Industrial Manpower

### (i) Engineers (Grade I)

A major problem is the fact that the Grade I engineer usually comes to the manager's office right after his higher education and without any experience on the production line.

In most industrialized countries university graduates have to obtain practical experience on the production line in order to acquire particular and practical engineering skills and technology in addition to production management skills.

(ii) Skilled Workers (inclusive of semi-skilled workers)

The main problem at present is that no maintenance is undertaken and no operational precautions against mechanical troubles are taken. The major cause of this problem is lack of technical (engineering) knowledge on the part of the skilled worker. It is therefore urgent that the skilled worker raise his level of skills and technology, particularly considering the vigorous development of the industrial sector that is hoped for.

One vivid example. We find in most of the engineering factories in Moshi that the cutting speed and the resetting of cutting tools are not properly coordinated resulting in lower machine durability, poor quality products, and lower operational efficiency.

The solution of the above-mentioned problems should involve not only improvement of the ability of skilled workers but also improvement of coordination between Grade I engineers and skilled workers, the former contributing to the establishment of clear and accurate engineering standards.

Skilled workers should therefore be trained so as to acquire basic theoretical and practical knowledge in engineering as soon as possible. The most efficient way of accomplishing this is by means of short training courses. It will also be necessary to pave the way for specialization and diversification of various industrial activities as industrial development proceeds.

(iii) Demand for Manpower in the Future

The following components have been included in estimating future demand for manpower:

- (a) Number of employees in existing industries
- (b) Necessary number of employees in expansion industries
- (c) Necessary number of employees in new industries
- (d) Necessary staff strength of KIDC.

The following table gives the assumed breakdown of present employment.

Assumption Present Structure of Employment (Table 49)

Grade	Assumption Breakdown	Present Employment (1976)
I	2 %	89
II	5 %	221
III & IV	83 %	3,674
V	10 %	443
Total	100 %	4,427

Manpower requirements by grade and by year for expansion industries, new industries, and KIDC are separately summarized in Table 50, Table 51 and Table 52, respectively. The total manpower requirement by grade and by year is estimated in Table 53, net employment presumed to increase by 1,500 over the coming 5 years.

Necessary Number of Employees in Expansion Industries (Table 50-a)

Grade	1st	2nd	3rd	4th	5th	Total
Estimated number of industries	10	20	25	25	30	110
Estimated number of employees	6	6	6	6	6	30
Total	60	120	150	150	180	660

Grade-wise Distribution of Necessary Manpower in Expansion Industries (Table 50-b)

Grade		1st	2nd	3rd	4th	5th	Total
I	(2%)	1	2	3	3	4	13
II	(5%)	3	6	8	8	9	34
III & IV	(83%)	50	100	124	124	149	547
V	(10%)	6	12	15	15	18	66
Total		60	120	150	150	180	660

Total Manpower Requirements by Grade and by Year (Table-53)

	1st	2nd	3rd	4th	5th	Total
KIDC	3	-	-	-	-	3
Existing/ Industries	89	-	-	-	-	89
I Expansion Industries	1	2	3	3	4	13
New Industries	1	2	3	4	5	15
Total	94	4	6	7	9	120
KIDC	6	3	2	1	1	13
Existing Industries	221	-	-	-	-	221
II Expansion Industries	3	6	8	8	9	34
New Industries	3	6	6	10	12	37
Total	233	15	16	19	22	305
KIDC	6	3	2	1	1	29
III Existing Industries	3.674	-	-	-	-	3.674
& Expansion IV Industries	50	100	124	124	149	547
New Industries	46	96	103	161	202	608
Total	3787	202	231	286	352	4858
KIDC	-	17	11	3	2	33
V Existing Industries	443	-	-	-	-	443
Expansion Industries	6	12	15	15	18	66
New Industries	6	12	12	19	24	73
Total	445	41	38	37	44	615
New Employment Creation	142	262	291	349	427	1471



