

Chapter 6

The Functions of R.I.D.C. and Analysis of its Operation

6-1 Project Selection and Financing

a) *Geographical Restraints on Project Selection and Financing*

In the four R.I.D.C.'s established experimentally, the R.I.D.C. manager and advisers from the supporting country selected and evaluated their projects.

Taking the Nyeri R.I.D.C. as an example of the range of their activities, 70% of the persons registered as financing recipients are operating within a radius of 30 km, as shown in Table 6-1. Although a good number of craft industries are scattered throughout Muranga, Kiambu, and Nyahururu, the fact that the selection of projects and financing them cannot be applied throughout Central Province indicates that a radius of 30 km is the range in which the R.I.D.C. can provide satisfactory service. At greater distances, transportation expenses become large, the costs for one R.I.D.C. increase, and efficiency falls off.

It can thus be expected that establishing new satellite R.I.D.C.s in Nyahururu, Muranga, and Nanyuki will permit more precise service and make the selection of the project more suitable to the conditions present in the region concerned.

Table 6-1 Distance to Recipients of R.I.D.C. Financing

0 - 10 km	11	{ Thunsoma, Kiganjo, and Nyeri regions. Including Karatina.
11 - 20	11	
21 - 30	5	
31 - 40	0	
41 - 50	0	
51 - 60	1	Nanyuki
61 - 70	1	
71 - 80	1	
81 - 90	0	
91 - 100	0	
101 - 200	3	
201 or more	4	Kiambu

(Source) Operating records of Nyeri R.I.D.C.

b) *Guidelines for Project Evaluation*

Regarding the selection and evaluation of the projects the DANIDA report points out that there must be a distinction between the following two matters:

- 1) Projects already existing in the region which are highly economical and contribute to the elevation of the level of the region's industry.
- 2) Projects which spread new technology in new types of industry.

Particularly in regard to the R.I.D.C., the report suggests that it should be fostered with the emphasis on the former of these two points. (*A Report of the Consultants to DANIDA*; Dr. Inukai, Prof. Okelo.) This is related not only to the policies

for selection of industrial projects for the estates but to every R.I.D.C. activity in the Nyeri region, but basically, emphasis in the evaluation should not be placed only on the economic evaluation of loan repayment performance, either short-term or long-term, using such evaluation for decisions of what kind of project should or should not be chosen, nor should policies be instituted for introduction of new industries for which there is no industrial foundation or for the spread of high-level technology alone. Instead, thought should be given to the social benefits of spreading new technology in already existing craft industries and to policies which will permit financing of the introduction of such new and effective technology.

The existing craft industries have their own specific needs for the introduction of new technology, and it is necessary to set up financing authorization standards which will support such needs.

The next point concerns the procedures for approval of R.I.D.C.s which should be carried out in Nyeri region. In the past, the R.I.D.C. manager and the technical adviser have simply evaluated the projects, with those requiring no more than 50,000 ksh in financing being decided by the Nyeri Project Financing Approval Committee and those exceeding that amount being subject to the approval of the Financing Committee of the K.I.E. Board of Directors. In the future, however, it will be important for each R.I.D.C. to be carried on centered on the Nyeri industrial estate, with approval and authorization hopefully being conducted as shown in Fig. 6-1. In other words, instead of coming out strongly with policies for the financing of new, highly economical projects in addition to the types of industry already existing in the industrial estates, the R.I.D.C. should, it is proposed, approve the financing of introduction of new technology for existing industries, taking into account the benefit to society and the ripple effects. Based on this proposal, projects below a given sum (at present 50,000 ksh) should be selected and evaluated by the R.I.D.C. and should be authorized independently by the loan committee for each district. The R.I.D.C. would provide the financing and present an accounting report to the regional manager of the Nyeri industrial estate every quarter. In order to expand the range of the craft industries covered by R.I.D.C.s or diversify the present product mix, even if only on a small scale, projects of such a scale should be carried out experimentally, centered around the various individual R.I.D.C.s

Next, as shown in Fig. 6-2, project financing for projects which are of somewhat greater scale and can be called small factories should be evaluated by the R.I.D.C. manager and the technical advisers together with the economics of the Nyeri industrial estate, with the resultant comments presented to the provincial loan committee. Such projects would consist of existing craft industries in the transitional stage of becoming small factories, and the R.I.D.C. would perform after-financing service; in addition, problems in the transition from operations as a household-industry to operations as a craft industry would be fed back to the R.I.D.C., and in this sense, the R.I.D.C. should participate actively in selection.

Fig. 6-1 Projects for which R.I.D.C. Can Conduct Selection and Evaluation Independently (Case I)

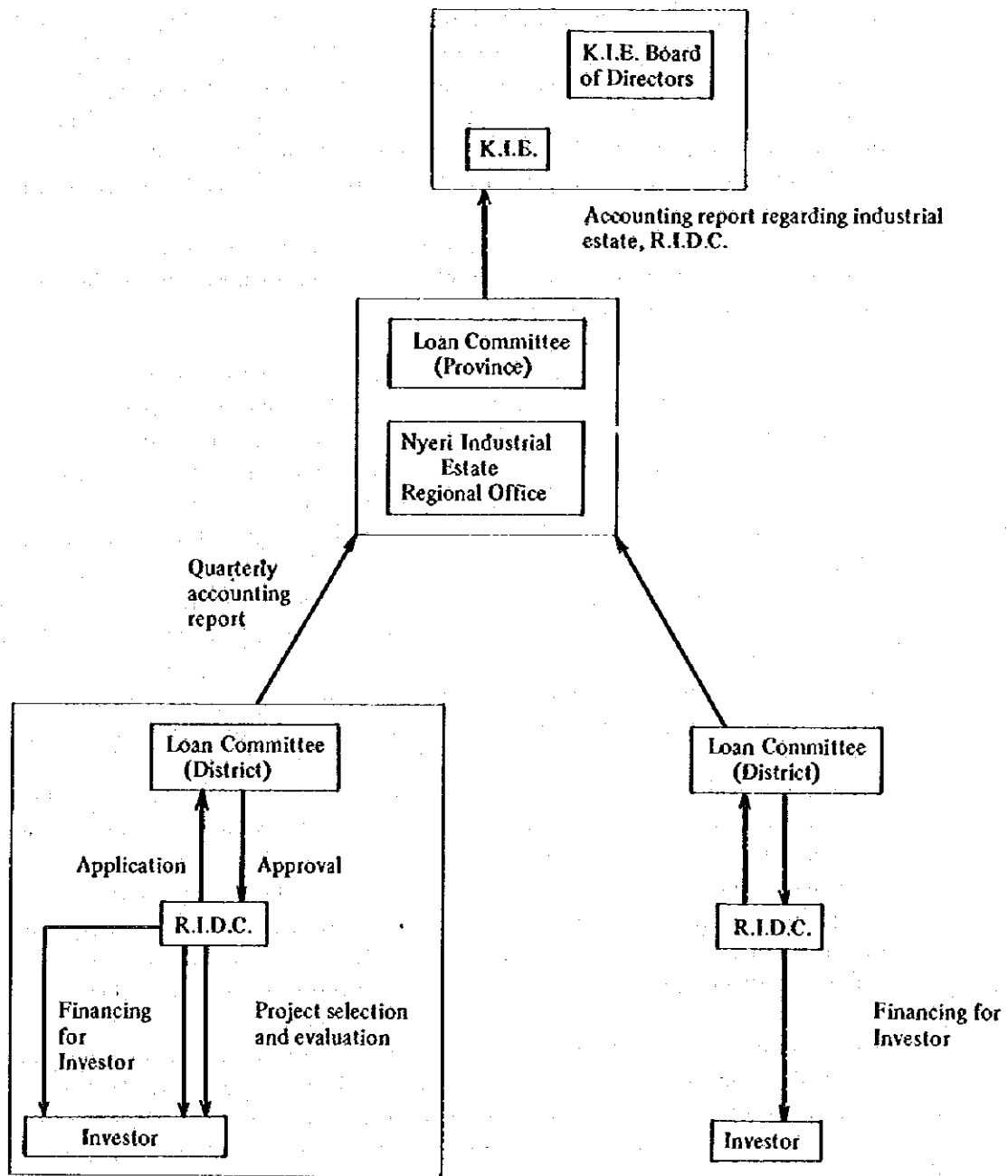


Fig. 6-2 Projects for which R.I.D.C. and Nyeri Industrial Estate Conduct Selection and Evaluation Together (Case II)

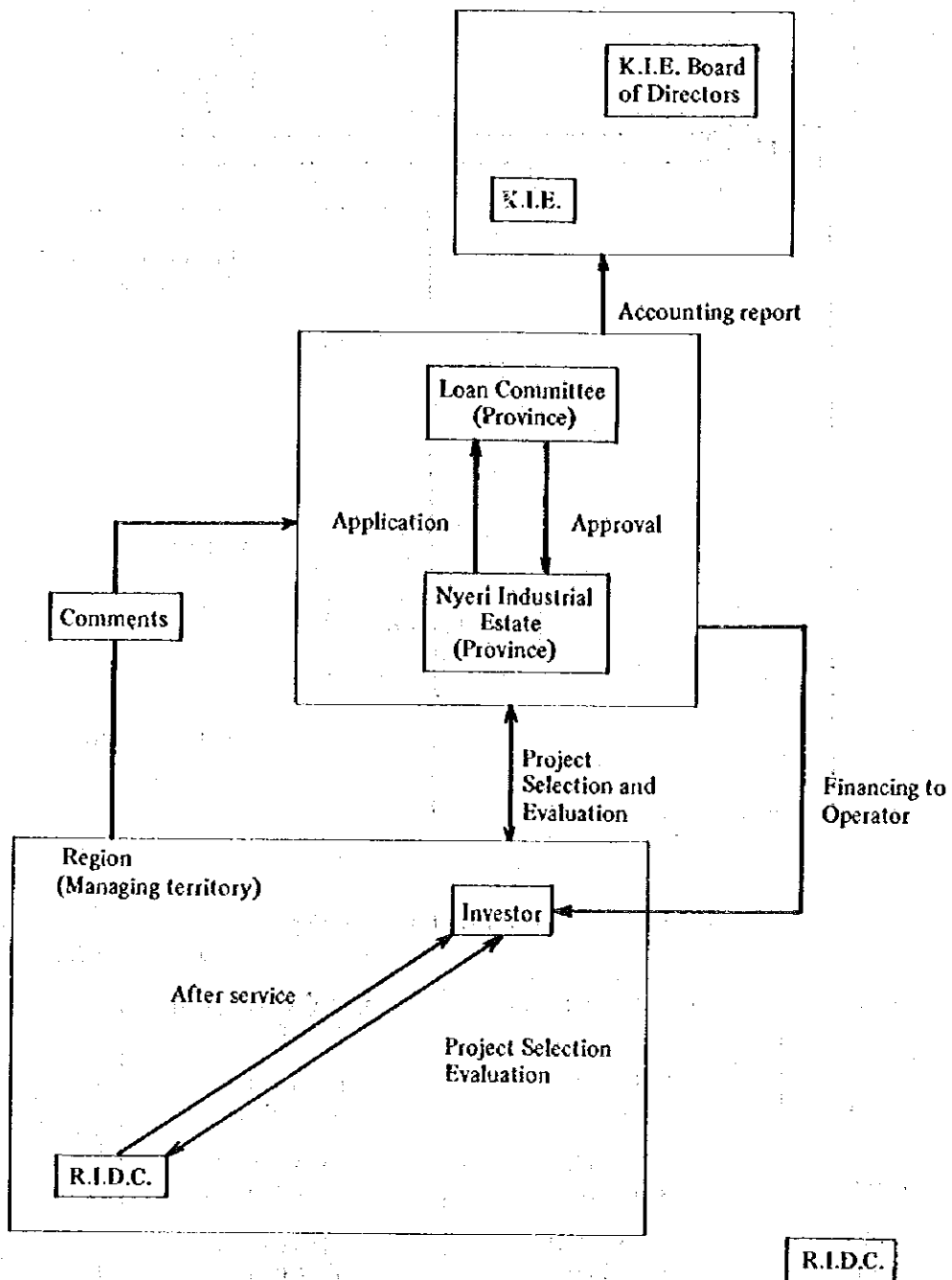


Fig. 6-3 Large Scale Projects to which R.I.D.C. Does Not Contribute (Case III)

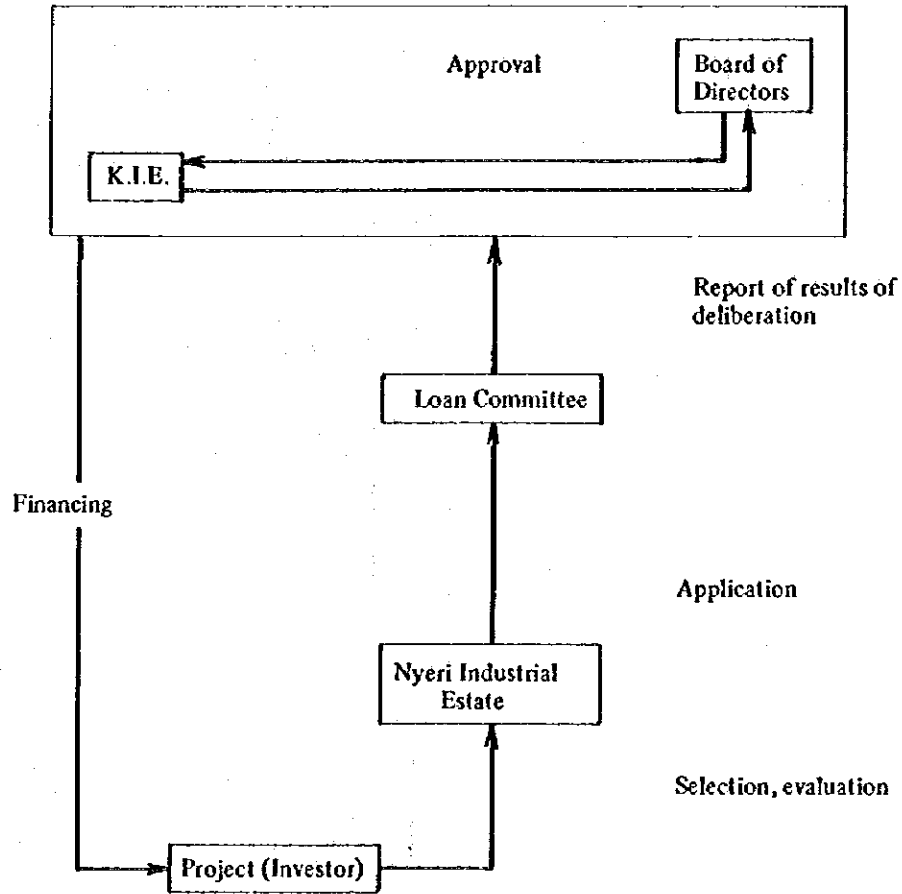


Table 6-2 Status of R.I.D.C. Financing

(June 30, 1976)

	Cases	Amt. Approved (ksh) A	Amt. Financed (ksh) B	B/A
Embu (R.I.D.C.)	13 (avg.)	2,743,130.00 (211,010)	1,625,929.05 (125,071)	} 59%
Nyeri (R.I.D.C.)	29 (avg.)	885,942.10 (30,550)	824,126.95 (29,039)	
Machakos (R.I.D.C.)	18 (avg.)	310,545.55 (17,253)	289,085.75 (16,060)	

Source: K.I.E. records as of June 30, 1976.

Note: Total number of cases counted from 1972.

Finally, as a supplementary note, if the scale becomes considerable, as shown in Fig. 6-3, the evaluation of projects that seem likely to have even a small effect on the economy should be left to the Nyeri industrial estate staff even when the projects are within the areas covered by the R.I.D.C.s. Furthermore, the approval should be made by the K.I.E. and the financing also provided directly by the K.I.E. In such case, it would be possible for such projects to enter the free design area of the Nyeri industrial estate, and it would be ideal if future projects for which the selection is conducted by the R.I.D.C.s were designed to provide producers' goods to the large projects.

c) Financing Activities of the R.I.D.C.

Next, let us turn to the scale of activities of projects for potential financing by the R.I.D.C. As can be seen from Table 6-2, records of past activities indicate that the total financing on the average for Nyeri, Embu, and Machakos is from 20,000 to 30,000 ksh, and the scale of financing for individual projects is comparably small.

According to Nyeri R.I.D.C. materials for March 1977, however, financing of 40,000–50,000 ksh account for approximately one-half (see Table 6-3). In addition, financing for the maximum amount of 50,000 ksh comes in 10 cases, 25% of the whole. These cases represent cottage industries, but there have been complaints that because of the limit on financing, there are restrictions on equipment and facilities investment and it is impossible to carry out operations with sufficient efficiency. Inflation can also be thought to have had its effects, so that it appears essential to raise the upper limit of financing by 20-40%. At the same time, it also seems necessary to adjust the maximum amount of financing for those cases where the Nyeri industrial estate and the R.I.D.C. together conduct selection and evaluation (Case II). In short, it will also be beneficial in fostering the industry of the province as a whole for the Nyeri industrial estate to give a strong independence and to give responsibility for selection and evaluation.

Table 6-3 Status of Nyeri R.I.D.C. Financing, 1972-1976
(Total Cases)

0–10,000 ksh	2 cases
–20,000	4
–30,000	11
–40,000	6
–50,000	17

d) Loan Committees and Their Membership

Finally, let us deal with the loan committee of the R.I.D.C. At already mentioned, projects that have been given an economic evaluation at each of the R.I.D.C.s are at present referred to a loan committee of the local government for the area (at the province level), where the project must receive approval. The following is a list of the members making up the loan committee for Nyeri Province.

- (1) Provincial planning officer (economic planner)
- (2) Provincial trade officer

- (3) Provincial I.C.D.C.
- (4) Provincial physical planning officer
- (5) Town clerk
- (6) R.I.D.C. manager
- (7) K.I.E. staff

The main purposes of the committee are as follows:

- (1) To prevent intercession of political pressure regarding the financing of specific projects.
- (2) To prevent collusion between the operator (loan applicant) and the R.I.D.C.
- (3) To apply to the I.C.D.C. or a bank for the loan and clarify the process or its rejection.

It can be thought that such a committee will continue to be necessary in the future for approving R.I.D.C. loans for projects in Central Province, but thought must be given to local characteristics in selecting the composition of the committee. The following, for example, might be considered.

Committee Composition

(When the specific R.I.D.C. is centered on the Nyeri industrial estate)

- (1) Provincial planning officer (P.P.O.), or Deputy planning officer (D.P.O.)
- (2) District trade officer
- (3) Regional manager of the Nyeri industrial estate (I.E.)
- (4) R.I.D.C. chief advisor or R.I.D.C. manager
- (5) Town clerk (or municipal council)
- (6) District development officer

This arrangement shifts the loan committee from the provincial level to the district level and brings participation by the regional manager of the Nyeri industrial estate in place of the K.I.E. staff. However, in the case of somewhat large projects for which the selection and evaluation are conducted centered on the Nyeri industrial estate (in other words, Case III), procedures would be as in the past, with approval being given by the loan committee on the Central Province level.

e) Projects for Financing and Estimated Amount of Financing

Following the establishment of each R.I.D.C., detailed financing plans should be drawn up by the technical advisors and the R.I.D.C. manager, and at present, the Nyeri R.I.D.C. does have the outlines of projects which should be selected by each of the local R.I.D.C. (Nyahururu, Muranga, Nanyuki, and Nyeri). Since, however, these projects have not yet been given concrete evaluation, it is dangerous to decide such latent R.I.D.C. financing projects at this time and calculate the amounts to be invested at a later point.

However, judging from the experiences of the four R.I.D.C.s already established, the average amount invested in individual projects handled in Central Province (an

amount which it must be remembered represents the investment by the R.I.D.C. in the financing institution) has been around 30,000 ksh. Assuming that the projects approved for future R.I.D.C. loans are the 23 projects given as an example in Table 6-5, the amount of the loans would be approximately 6 million ksh. Even judging from the past record of the Nyeri R.I.D.C., it can be assumed that the various R.I.D.C.s of Central Province would likely finance projects with the scale and numbers illustrated by Table 6-4. For Nanyuki, however, since the performance around Nanyuki suggests that the number of potential projects for financing would not approach the numbers for Nyeri and Embu, the estimated values are also low.

Table 6-4 Estimated Investments by R.I.D.C.

Muranga	30 projects	x 30,000ksh =	900,000ksh
Nyahururu	30 projects	x 30,000ksh =	900,000ksh
Nanyuki	15 projects	x 40,000ksh =	600,000ksh
Nyeri	40 projects	x 30,000ksh =	<u>1,200,000ksh</u>
TOTAL			3,600,000ksh

Table 6-5 Projects Approved by Embu R.I.D.C. (as of February 1977)

	Project	Location
1.	Saw Mill	Embu Township
2.	Salt Grinding	Meru Township
3.	Bakery Project	Embu Township
4.	Auto Garage	Kivangua-Embu
5.	Dry Cleaner and Laundry	Chuka-Meru
6.	Fruit Canning	Embu Township
7.	Honey Refinery	Embu Township
8.	Saw Mill	Ngaya Forest-Meru
9.	Leather Products	Embu Township
10.	Tubular Steel Furniture	Kianyaga-Kirinyaga
11.	Cotton Spining	Meru Township
12.	Concrete Blocks	Isiolo Township
13.	Wood Workshop	Embu Township
14.	Tailoring and Dressmaking	Embu Township
15.	Block Board Products	Sagan Township
16.	Metal Workshop	Meru Township
17.	Metal Workshop	Ena-Embu
18.	Welding Workshop	Embu Township
19.	Panel Beating	Embu Township
20.	Metal Workshop	Meru Township
21.	Wood Workshop	Mekinduri-Meru
22.	Concrete Blocks	Chuka-Meru
23.	Knitwear	Meru Township

(Source) Embu R.I.D.C. materials.

6-2 On-the-Job Training in Workshops and Extension Service Related to Repairs

6-2-1 On-the-Job Training

At the time of the establishment of the R.I.D.C.s, DANIDA proposed the following to promote technological guidance and the spread of technology.

Instruction in the use of tools and machinery that can be used in cottage industries. Even if guidance is provided in machinery with a high level of technology, it will not be possible to reflect such instruction in cottage industries, and frustration can also result from not being able to purchase the machinery whose use has been learned. For such reasons, technical guidance provided in the R.I.D.C. common workshop should have the aim of permitting a better product mix of the individual products currently being produced.

The R.I.D.C. workshops were begun based on this basic policy, and these workshops were provided with three divisions, one offering the necessary tools, one for wood working, and one for sheet metal working. Policies were then set up for offering technical guidance, practice, and production and sales promotion suited to specific needs. In Nyeri, however, part of the workshop was rented to nearby operators of cottage industries, so that it has been used in ways apart from the above aims.

As is clear from looking at specific use conditions for individual machines, there is a division between those that receive a lot of use and those that are used almost not at all. For example, machines receiving less than ten hours of use a year include the bench drill, bench grinder, and power saw for the wood workshop; the sheet metal folder and the power bending roller in the sheet metal workshop; and the band saw blade sharpener in the repair shop. In contrast, there is relatively great use of the universal wood working machine, the electric welding machine, the universal center lathe, and the like.

Table 6-6 (1) Use of Machinery at Nyeri R.I.D.C. Use of Machinery in Wood Workshop June 1975-July 1976

Type of machine	Hrs. of use	Use cost (ksh)
Universal wood working	2/3	929.50
Band saw	72 1/4	72.25
Lathe for woodworking	36 1/2	36.50
Belt sander	42 1/2	42.75
Bench drill	3 3/4	3.75
Bench grinder	3/4	0.40
Power saw	5	5.00
TOTAL	373.75	1,090.15

Table 6-6 (2) Use of Machinery in Sheet Metal Workshop

Type of machine	Hrs. of use	Use cost (ksh)
Electric welding machine	338 1/2	757.00
Pedal guillotine	21	35.00
Universal bender	25	25.00
Sheet metal folder	6	18.00
Power bending roller	26	78.00
Welding machine	3 1/4	14.25
Gas welding machine	20 1/2	108.00
Die	20 3/4	124.50
TOTAL	461	1,159.75

Use of Machinery in Repair Shop

Universal centre lathe	74 1/2	460.75
Pillar drilling machine	89 1/4	89.25
Band saw butyl welder	20	58.50
Power hacksaw	178 1/2	183.25
Tool post grinder	59 1/4	295.25
Band saw blade sharpener	2	6.00
Lathe	2 3/4	21.00
TOTAL	426.25	1,114.00
GRAND TOTAL USE COST		3,342.90 ksh

Table 6-7 Geographic Distribution of Persons Registered with Nyeri R.I.D.C.

Nyeri	50
Kirinyaga	5
Nyandarua (including Nyahururu)	5
Muranga	8
Laikipia (including Nanyuki)	1
Kiambu (including Tika)	6
TOTAL	75

Source: R.I.D.C. registration list

Tables 6-6 and 6-7 indicate the hours of use, the days of use, and distance distribution for registrants with the Nyeri R.I.D.C. When the operators of the craft industries concerned are listed up as R.I.D.C. registrants, it can be seen, as shown in Table 6-7, that over 65% are operating in the Nyeri district. In particular, almost all of the registrants using the workshop are from within the Nyeri district.

Next, as shown in Table 6-8, there were seven registrants using the facilities for 60 hours or more, and these persons together represent 83.5% of the total use time. In other words, a mere seven persons account for 83.5% of the use of the common workshop and repair shop, an undesirably low level in terms of the spread of technology. The reason is not that the unused machinery is difficult to operate or that it requires special technology. Instead, the following reasons can be considered important. (1) Simply that the jobs or types of industry requiring such machinery are not present near the R.I.D.C. among the R.I.D.C. registrants, (2) The R.I.D.C. itself does not have the policies to foster the concerned types of new industry, so that it cannot

create the need for the use of such machinery, and (3) Instead of creating such needs, the R.I.D.C. is renting part of the common workshop to operators without such workshops as a simple means of gathering workshop use fees.

Table 6-8 Use of Machinery in Common Workshop and Repair Shop of R.I.D.C.

Hrs. of use	No. of users	Total use time	%
0-10	6	27	2.1
11-20	5	73.25	5.6
21-30	3	77.25	6.1
31-40	1	32.50	2.5
41-50	0		
51-60	0		
66.5	1	66.50	5.2
77	1	77	6.0
101.25	1	101.25	8.0
169	1	169	13.3
292.50	1	292.50	22.9
358	1	358	28.1
TOTAL	22	1,274.75	100.0

Source: Job cards for 1975-1976.

The resolution of the above three problems is in part related to the distance over which the R.I.D.C. can provide service, but it is essential to have a firm grasp of what kind of machinery can serve what degree of needs within a radius of 30-40 km.

In other words, in establishing future R.I.D.C.s, the status of nearby industry and the needs for the R.I.D.C. workshop should be investigated in advance and a more detailed program for the spread of technology in the cottage industries should be prepared so that machinery and facilities with high use value can be provided. As part of this process, it is necessary to study what level of technology should be introduced and spread. Ideally, policies for the spread of technology should be arranged so that over a year at least 20 to 30 persons would use the workshop and repair shop machinery an average of around 180 hours, and such matters must be taken into account in the program.

Regarding Nanyuki, it can be judged that it has already passed the stage at which the industrial structure should center on cottage industry to reach the stage where there is a low degree of need for the spread of technology oriented toward the craft industries through the R.I.D.C. workshop. The total number of manufacturing operators involved is only 13, and in a district where there is the potential for the promotion of activities relating to large-scale industry, it is best to think that there is no need to establish an R.I.D.C. workshop. To the contrary, it would seem more desirable to take a long-term view (that is, considering the possibility of establishing a Nanyuki industrial estate), build a structure for repair shop use which could also become management offices and a technical service center as well, providing it with repair machinery appropriate to the existing needs; at the same time, it would also be desirable to experimentally erect an I.P.A.-type shed and, when large-scale factories are established, to introduce the types of industries that can supply capital goods to such large-scale factories.

Finally, regarding the cost of the machinery installed in the R.I.D.C. common workshop and repair shop, it is impossible to make detailed calculations of cost because the machinery must be appropriate to the specific needs of the given area, but for reference, the cost of R.I.D.C. machinery purchased during 1972 was as follows.

R.I.D.C. Machinery Cost June-December 1977

Wood workshop	39,985
General repair shop	64,471
Sheet metal workshop	75,894
TOTAL	180,350 (ksh)

In terms of the types of machinery which are actually necessary, the following main types may be considered a minimum, though some adjustments may be necessary.

Wood Workshop

- Universal Woodworker
- Band saw
- Lathe for woodworking
- Belt sander
- Bench drill
- Bench grinder
- Power saw

Repair Shop

- Universal center lathe
- Pillar drilling machine
- Band saw buff-welder
- Power hack saw
- Tool post grinder
- Band saw blade sharpener

Sheet Metal Workshop

- Electric welding machine
- Power bending roller
- Sheet metal folder
- Pedal guillotine
- Universal bender
- Gas welding machine
- Die

6-2-2 Technological Service as Part of Extension Service

As one of the R.I.D.C. services, when machinery that the R.I.D.C. has financed breaks down, the R.I.D.C. provides repair service. The R.I.D.C. repair shop thus performs two different functions: repair of machinery already owned by registered operators, and repair of machinery financed by the R.I.D.C.

In either case, the Nyeri R.I.D.C. has in the past first confirmed whether the broken machinery can be repaired in the registrant's own repair shop (which naturally includes reg-

istrants who themselves operate repair shops), and only in cases where this is impossible are the repairs conducted by R.I.D.C. technicians at the R.I.D.C. repair shop. If it is also impossible to repair the machinery at the R.I.D.C. repair shop, it is taken to the Technical Service Center (T.S.C.) in Nairobi for repair. In the future, this policy of promoting the local repair shops should basically be followed, and the R.I.D.C. and the industrial estate's T.S.C. should never be in the position of competing with local repair shops. Whatever the event, they should always play a supplementary role.

Thus, considering the overall development of Central Province centered around the Nyeri industrial estate, the repair of machinery financed by the various R.I.D.C.s should be carried out according to the following order of priorities.

Local repair shops
R.I.D.C. repair shop and R.I.D.C. technicians
Nyeri industrial estate T.S.C.

6-2-3 Managerial Training and Circulating Guidance

In general, industrial development in agricultural areas tends to present larger problems in management matters than in technical matters. In many cases, there are plenty of persons skilled in providing technical instruction, but again in many cases there is no system available that can provide managerial sense in carrying out an operation.

The report from DANIDA also emphasized this point. It proposed that since the R.I.D.C. staff designed to fulfill an instructive role (one R.I.D.C. manager, one technical advisor, three technicians) is far from sufficient to provide satisfactory managerial guidance, the Management and Advisory Training Center (M.A.T.C.) classrooms should be used to offer lectures in management.

These M.A.T.C. lectures offer one and two week courses, the former being the responsibility of the district trade officer, the latter the responsibility of the provincial trade officer. The contents consist of (1) bookkeeping, (2) management and sales promotion, (3) control finance and credit facilities, and (4) a special course in import and export trade, held in a location offering lodging facilities and providing the operators of cottage industries or small factories the knowledge they need for their operations.

In reality, such lectures were offered for two years after the establishment of the Nyeri R.I.D.C., once or twice a year, but they have not been held for almost two years. The reason is that, first, there are no lodging facilities at the R.I.D.C., placing severe limits on the number of persons who can attend even a one-week course of lectures; and second, that the M.A.T.C. simply offered the same lecture course once in each district and at the provincial level, so that the content of the lectures overlapped.

There is thus little meaning in the R.I.D.C. holding the same type of course, and the necessity of offering a new system that will strengthen and promote management remains a major problem. There are two possible approaches to this problem.

First, the M.A.T.C. could carry out short-term courses on subjects not yet offered, providing such courses for the R.I.D.C. registrants. Such courses could, for example, include methods of arranging show displays and practical strategies.

Second, the M.A.T.C., the R.I.D.C., and the industrial estate could strengthen the functions which tie them to the individual operators in their areas. For instance, it is important for these organizations to maintain close communications and form a system whereby information on the lectures offered could be spread throughout Central Province through the industrial estate and the R.I.D.C. Such a system would make it possible to grasp the needs within the region, approach M.A.T.C. to offer lectures suited to such needs, and efficiently report the contents of the M.A.T.C. lectures to the R.I.D.C. registrants, thus seeking greater measures of guidance in managerial problem.

6-3 Functions Lacking in Existing R.I.D.C.s

In the past, the functions of the existing R.I.D.C.s have been seen as broadly divided into the following categories: (1) groundwork and financing for projects; (2) circulating guidance in technology and management; and (3) the spread of technology through on-the-job training. Here, let us consider the supplementary functions which permit these major functions to be performed effectively.

(a) *Promotion*

Promotion has a variety of meanings, such as the following:

- (1) An important point in the development of villages' industry is that when items are produced through the spread of technology, there must be promotion of the products so that they bring greater profits. Going beyond simple managerial guidance, this requires that there should be efforts in marketing promotion and also marketing techniques.

With the establishment of an industrial estate in Nyeri, there may be the possibility that the products being promoted by the R.I.D.C. can be used as producers' good for the estate. It is thus necessary to maintain communications between each R.I.D.C. and the industrial estates' economists or marketing or procurement specialists.

- (2) To raise the level of the managers, lectures are held through M.A.T.C. as described above, but it is also important to gather such information and promote it for the operators in the region.
- (3) In order to encourage the spread of new technology among operators in the vicinity, there should be publicity urging use of the workshop and promotion so that the people of the vicinity will make efficient use of the machinery provided in the workshop.

(b) *Procurement*

Here, "procurement" refers to both the procurement of the machinery and the procurement of raw materials. Regarding the former, since the R.I.D.C. holds a

mortgage on the machinery it has financed, it conducts carefully considered advice. Regarding the materials, however, it does not provide advice. It has been suggested by Nairobi University Working Paper No. 210 that in terms of lowering manufacturing costs, consideration should be given to a system that permits bulk purchases. This should be further expanded, contact should be made with the procurement officer of the Nyeri industrial estate, and the R.I.D.C. should be equipped to perform the function of carrying out communications so that if the procurement of inexpensive, high-performance machinery and bulk purchases of materials by the estate include items that can be utilised by the R.I.D.C. registrants, these can become available to the registrants.

6-4 Staffing and Operational Costs

The staff deemed necessary to operate the R.I.D.C. is basically the same as the staff deemed necessary in the past for the Nyeri R.I.D.C.

In other words, it has been suggested from time to time that the operating costs of the R.I.D.C. are extremely high, but let us assume that it is necessary to maintain the staff working at the Nyeri R.I.D.C. at the absolute minimum (see Table 6-9). Particularly regarding Muranga and Nyahururu, their operations can be expected to become quite active, and it would be difficult to reduce this level of staff and cut down operating costs.

Table 6-9 Nyeri Monthly Operating Costs Up to June 1977

(Unit: ksh)

	Basic pay/mo. *	Housing cost *
R.I.D.C. Manager	2,646	864
Technical Adviser	—	1,800
General Mechanic	658	324
Sheet Metal Technician	658	324
Wood Work Technician	658	324
Center Cashier	1,051	576
Stores Clerk	392	288
Receptionist	392	288
Office Messenger	277	288
Driver	277	288
Driver	277	288
Unskilled Worker	277	288
Station Hand	277	288
Watchman	277	288
Watchman	871	432
Copy Typist	277	288
TOTAL	9,265 1	7,236 2
Other costs: Cars (2)	8,400	
Office supplies & facilities	1,800	Total 15,000 3
Other operating costs	4,800	

* 1976 values plus 20%; 1 + 2 + 3 = 31,501 ksh

However, for the time being the Nanyuki facility will continue to have one center manager, one technical adviser, and one general mechanic. The repair shop will be reinforced as necessary, but since the R.I.D.C. does not include a workshop, it will be desirable to have the composition shown in Table 6-10.

Table 6-10 Projected Monthly Operating Costs for Nanyuki R.I.D.C.

	(Unit: ksh)	
	Basic Salary	Housing Costs
Center manager	864	2,646
Shorthand typist	432	871
Bookkeeper	576	1,051
Clerical officer	288	392
Store clerk	288	500
Driver	288	392
Telephone receptionist	288	1,814
Mechanical engineer	684	658
General mechanic	324	349
Unskilled worker	288	277
Station hand	288	277
Watchman & messenger	288	277
	<u>4,896</u> 1	<u>9,504</u> 2

Figures are based on 1976 plus 20%. 1 + 2 = 14,400 ksh

Automobile (one)	4,200
Office supplies and facilities	1,800
Other operating costs	4,800
Adviser housing allowance	1,800
	<u>12,600</u> 3

1 + 2 + 3 = 27,000 ksh

In the future, by placing the Nyeri R.I.D.C., along with the industrial estate, under the management of the manager of the regional office, it can be thought that the expenses for the manager, bookkeeper, shorthand typist, etc., would be included in a system whereby the industrial estate would become responsible for such expenses, so that it would be necessary to include only the expenses for the following persons:

	Basic Salary	Housing Costs
General mechanic	658	324
Woodwork technician	658	324
Sheet metal technician	658	324
Driver	277	288
Watchman	277	288
	<u>2,527</u> 1	<u>1,548</u> 2

1 + 2 = 4,075 ksh/month

Other operating costs: none

The operating budgets for the four R.I.D.C.s in Nyeri, Nyahururu, Nanyuki, and Muranga can thus be expected to be the following per month.

Nyeri	4,075 ksh
Nyahururu	31,501
Muranga	31,501
Nanyuki	26,723

TOTAL 93,800 ksh

(Annual outlay is $93,800 \times 12 = 1,125,600$)

In the case of the technical adviser, in the past the technical advisers have been assigned to each R.I.D.C. from Denmark on a grant basis, with the advisor providing technical advice for the promotion of the industry in each region. This function will continue to be extremely important in the future, and it is essential in terms of spreading the sponsoring country's technology, so that the stationing of such technical advisers should be continued in the future.

At the same time, however, if the expenses for the technical adviser are included in the operating expenses, the R.I.D.C. costs increase greatly. In other words, when the expenses for the advisor, including the absence fee for the period he is out of his home country, are calculated, they amount to about 500,000 ksh per person per year, making the R.I.D.C.'s operating costs impractically high. In the above calculations, these expenses have thus not been included in the costs, and we suggest that these expenses be ensured within the range of the technical assistance from the supporting country.

6-5 Suggestions regarding Establishment of R.I.D.C. and Its Management

6-5-1 Physical Set-up

- (1) New R.I.D.C.s established in Nyahururu and Muranga should carry forth the functions performed by the present Nyeri R.I.D.C.
- (2) The Nanyuki R.I.D.C. will have no workshop, and it will place the emphasis on the project financing function rather than on spread of craft industry technology; the aim should rather be the fostering of small factories. As the first step, it would be good for a small factory shed of the I.P.A. type to be established experimentally to provide a basis for continuation of this function as an industrial estate.
- (3) In Karatina, establish an I.P.A. and conduct its management through the Nyeri regional office or Nyeri R.I.D.C.
- (4) The present functions of the R.I.D.C. in Nyeri should be continued, but the management should be conducted through the Nyeri regional office. For this reasons, the regional office should use the present R.I.D.C. offices.

6-5-2 Organization

- (1) There should be an organization of the R.I.D.C.s which will promote the industrial development of Central Province as a whole, centering on the core provided by the Nyeri industrial estate.
Each of the R.I.D.C.s should be controlled by the regional office of the Nyeri industrial estate, and each R.I.D.C. manager should submit a status report to the regional manager each quarter.
- (2) The existing R.I.D.C. at Nyeri should come under the direct control of the regional manager.

- (3) The accounting function of each R.I.D.C. should be carried out in conjunction with the accountant of the regional office.
The accountant of each R.I.D.C. should report to the senior accountant of the regional office every quarter in the report of settlement of accounts regarding the status of R.I.D.C. financing and future estimates as well as the status of general operating expenses.
- (4) The functions of the repair shops of each R.I.D.C. should be carried in an organic relationship with the T.S.C. of the Nyeri industrial estate.

6-5-3 Staff

Basically, each R.I.D.C. should maintain the staff of about 18 persons that has been in actual use in the Nyeri R.I.D.C. However, in the case of Nanyuki, there is no need for a technical staff since, for the time being, it will not be provided with a workshop.

6-5-4 Functions of R.I.D.C.

a. *Project Selection, Evaluation, and Financing*

1. The R.I.D.C. should finance projects consisting of cottage industries, and the amount authorized for maximum financing should be 60,000 ksh at each R.I.D.C. (district level).
2. The emphasis should not be placed merely on evaluation of purely economic repayment in the short or long term. Consideration should also be given to social benefit, and financing limits should be set with such matters in mind.
3. The R.I.D.C. financing in the end takes as its subject the promotion of cottage industry, but the evaluation of financing of small factories outside the Nyeri area for which the scale of financing would be relatively large should be conducted in conjunction with the staff of the Nyeri industrial estate. However, the financing itself would be conducted by the Nyeri industrial estate itself.
4. Loan committees to approve the projects to be financed by each R.I.D.C. should be established at the district level, and they should be composed of the staff of the Nyeri industrial estate and the R.I.D.C. manager with the addition of members from that district.

b. *On-the-Job Training*

1. Policies should be formulated and carried out to provide instruction only in such technology as can be spread in cottage industry.
2. Strategies and programs should be prepared for the spread of technology so that the workshop can be put to effective use.
3. The types of machinery to be installed in the workshop should be decided only after repeated detailed investigation of the local needs.

c. *Extension Service: Technical Service, Managerial Service*

1. The R.I.D.C. should not offer training courses that are offered by the M.A.T.C. However, information on week-long courses offered by other training centers (at the district level) should be supplied to the R.I.D.C. registrants. Through such means, duplication of M.A.T.C. courses and R.I.D.C. managerial training should be avoided.
2. The technical services (including repair service, etc.) for machinery financed by R.I.D.C. and the managerial service should be subjects of a program actively carried

out as part of the R.I.D.C. promotional activities.

3. The procurement and marketing functions should be assigned to each R.I.D.C., and consideration should be given to linking these functions to the same functions carried out by the Nyeri industrial estate.

6-5-5 Summary

This survey of the establishment of R.I.D.C.s placed the emphasis on evaluation of the functions of each R.I.D.C. and calculated the costs of operation and activities (including workshop machinery). However, in order to have each of the R.I.D.C.s perform its functions of financing and the spread of technology effectively, it is necessary to make detailed studies of selection of the projects for financing the local needs for the spread of technology. Study should be again carried out in particular regarding the following matters:

1. Determination of the projects for financing by each R.I.D.C. (carrying out of F/S, preparation of financing schedule).
2. Determination of the types of machinery to be installed in the workshop.
3. Preparation of specific proposals for technology diffusion programs and management training.
4. Preparation of specific measures regarding functions lacking in the existing R.I.D.C.s (promotion, procurement, marketing, etc.).
5. Clarification of the number of technicians to be dispatched to each R.I.D.C. and the functions of each.

6-6 Outline of R.I.D.C. and I.P.A.

1. *Karatina I.P.A.*

a. Location

Approximately 400 m east of the center of town (the open air market), adjoining the railroad station (the line joining Nairobi and Nanyuki) on the western side. To the east of the site planned for the I.P.A. adjoining a railway side-line is land designated for industrial use.

b. Conditions of Site

The site is almost totally flat. The scale of the division as a whole is approximately one hectare, and the I.P.A. will occupy one part of the site. The site is bounded on three sides by roads (each of which is approximately 20 m in width) and the road to the west is a major urban route of Karatina.

c. Type and Location of Facilities

Type of Facilities

Ten workshops (two workshops occupying one building for a total of five buildings).

Workshop scale is 60 m² each, with construction of light steel reinforced construction.

Location of Facilities

The site is approached by the road on the east, and a single road runs through the site, with the workshops on both sides of this road.

The total area of the site is approximately 3,500 m².

2. *Nanyuki R.I.D.C.*

a. Location

Approximately 1,600 m west of the center of the town, with a railroad station

(the present terminal station) approximately 500 m to the southeast of the site. The site is surrounded (on the west, south, and western edge station road sides) by land designated in the town development plan (set up by the Ministry of Land and Settlement, Department of Physical Planning) for industrial use.

b. **Conditions of Site**

The site slopes slightly to the southeast (with a gradient of approximately 2-3%). The site is 10.5 hectares, and the present R.I.D.C. is located on part of the site. In the town development plan, the site is planned to be bounded on all four sides by roads. The road on the east side (planned for a width of approximately 80 m) is to be a major route in the town of Nanyuki.

c. **Type and Location of Facilities**

Type of Facilities

Six workshops and a administration building. The workshops will be the same as those for Karatina. The administration building will occupy a site of 250 m² and will have the same floor-space as the site area. It will be a single-level building of RC construction.

Location of Facilities

The site will be approached from the planned main urban road on the east side of the site. A single road will run through the site, with the workshops and the control building on either side of this road. The total area of the site is approximately 7,700 m².

3. **Muranga R.I.D.C.**

a. **Location**

Approximately 1,000 m west of the center of town, where a jail is currently located. The areas to the north and east of the site are residential areas, and according to the town development plan, an agricultural training center is to be located on the west side.

b. **Conditions of Site**

The site is inclined to the southeast. The gradient is fairly steep, about 15% for the site as a whole, though the inclination is less on the southern side (approximately 5%).

The entire site occupies approximately 4.6 hectares, and the present R.I.D.C. is located in part of the site at the southern side (where the incline is less). The site itself is separated from the area's main road, but according to the town development plan, an approach road is planned.

c. **Type and Location of Facilities**

Type of Facilities

The number, scale, and construction of the workshops and administration building are the same as for the Nanyuki R.I.D.C. The workshops and administration building will be located to branch off the one road to run through the site.

The total area is approximately 5,300 m².

4. **Nyahururu R.I.D.C.**

a. **Location**

Approximately 700 m meters southeast of the center of town, adjoining rail-road tracks on the west side. The site lies just outside of the Nyahururu business district.

b. Conditions of Site

The site slopes gently to the east (with a gradient estimated at about 5%). On the east side, the site is bounded by a still-unpaved road, but under the town development plan, that road is planned to become a circumferential road (approximately 50 m in width) running through the area outside of the Nyahururu business district.

c. Type and Location of Facilities

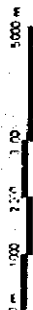
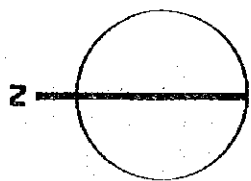
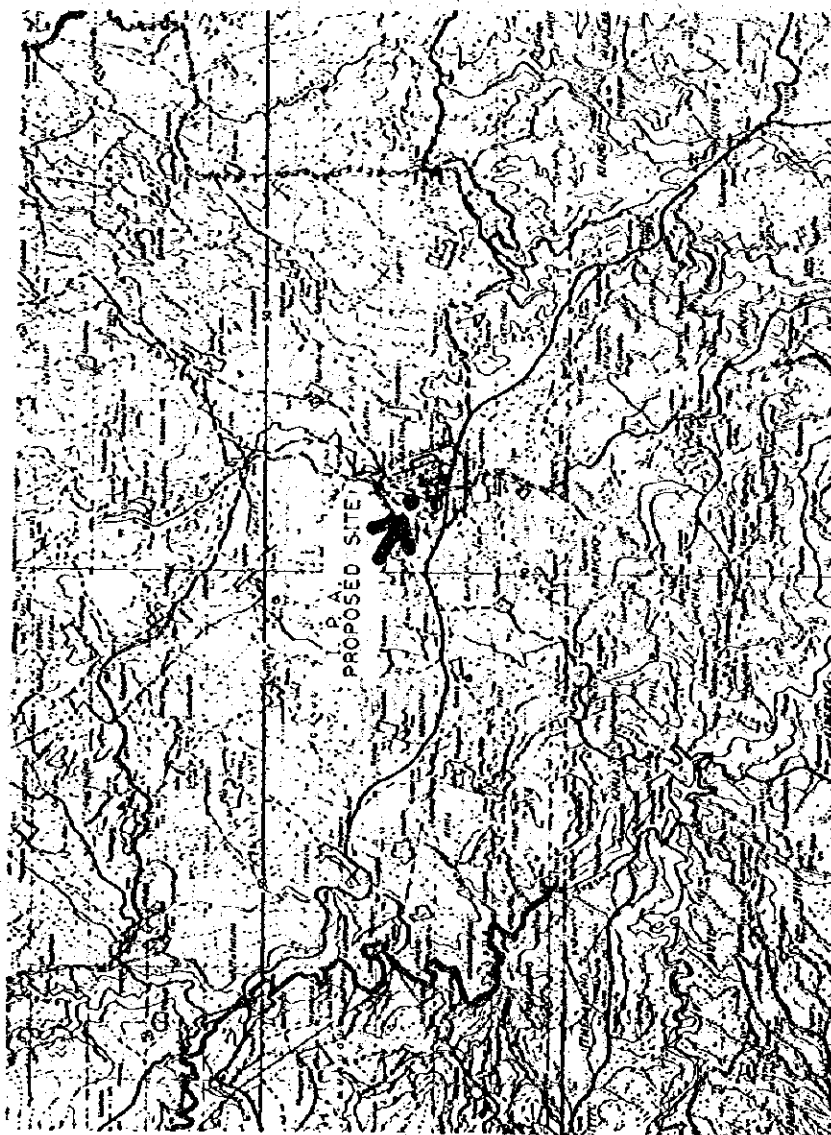
Type of Facilities

Eight workshops and an administration building. The scale and construction of the workshops and the administration building are the same as for Nanyuki and Muranga.

Location of Facilities

The site is approached by the road on the east side of the site. The location of the workshops and administration building will follow the same pattern as for Nanyuki.

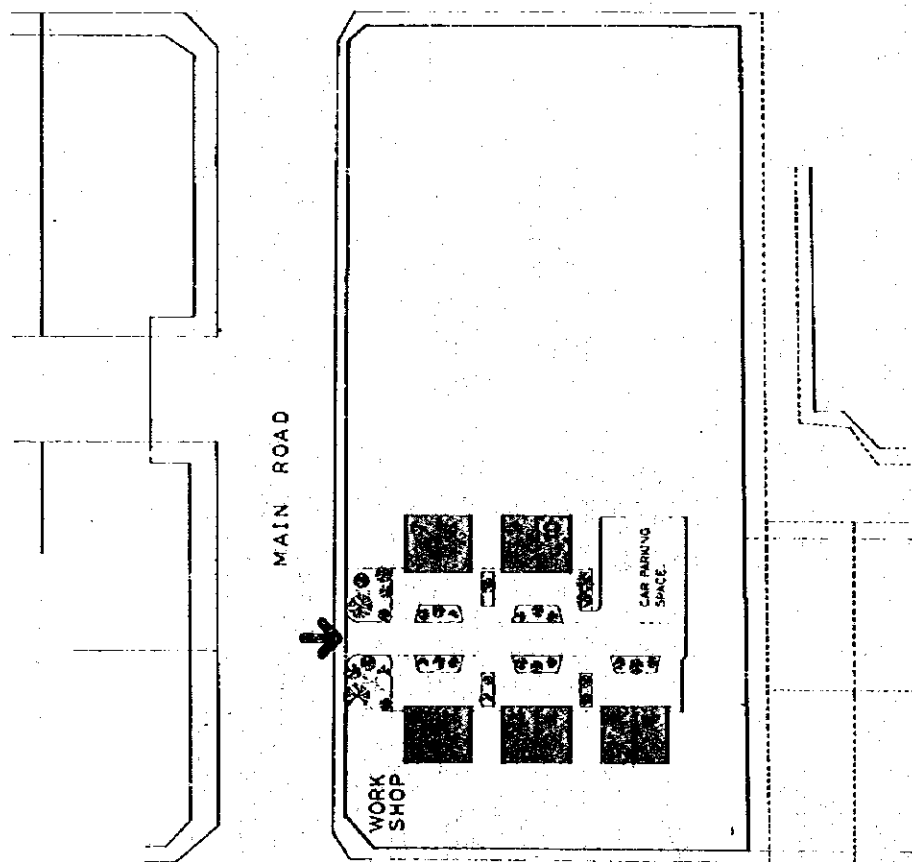
The total area of the site is approximately 5,400 m².



N.I.E.D. PROJECT	DATE	SCALE
22	15 JUN 77	1 : 50,000
LOCATION	DRAWING NO.	
JAPAN INTERNATIONAL COOPERATION AGENCY	0107/77	

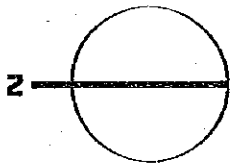
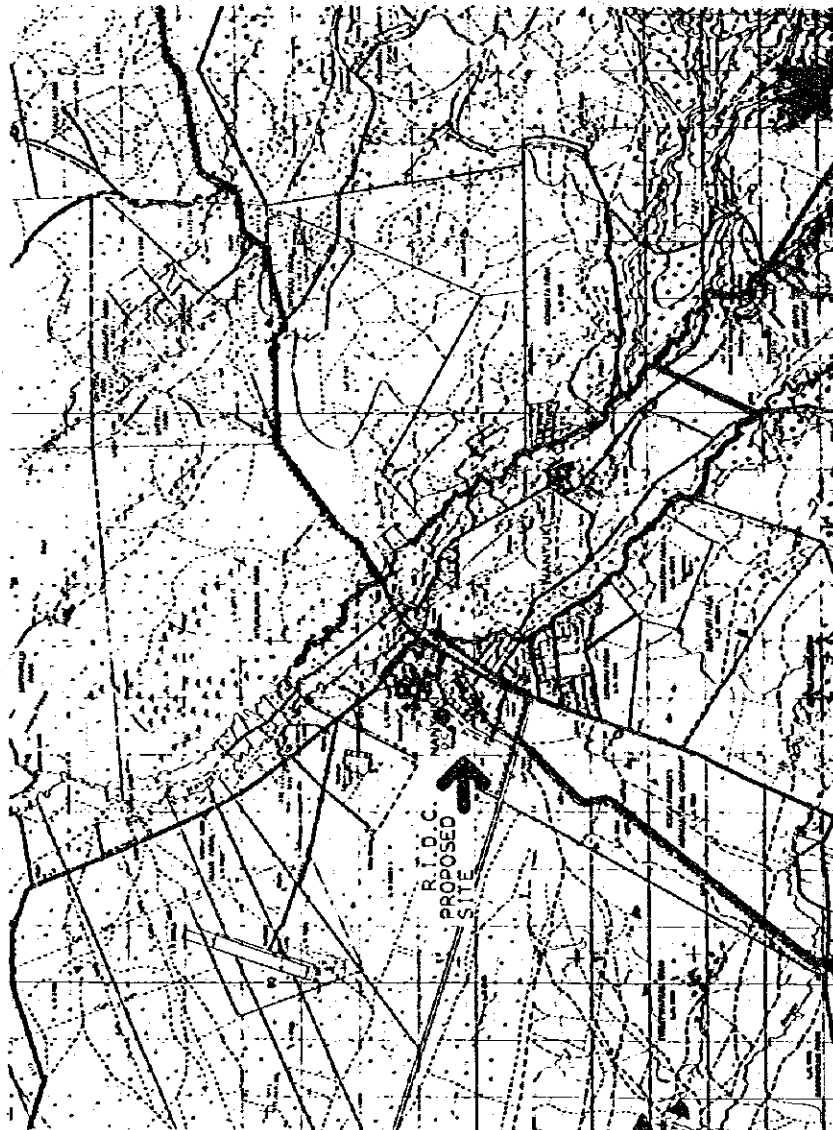
Fig. 6-4 I.P.A. Karatima Location S. 1 : 50,000

Fig. 6-4 I.P.A. Karatima Location



N.I.E.D. PROJECT.	DATE
23 KARATINA	30 JUN. 77
PLOT PLAN	SCALE
JAPAN INTERNATIONAL COOPERATION AGENCY	1 : 500
	DATE DRAWN BY
	CHKD BY
	DATE

Fig. 6-5 IP-A. Karatina Plot Plan



N. I. D. C. PROJECT	NO. JUN 77
24	1
LOCATION	3000
COORDINATES	
COORDINATE	

Fig. 6-6 R.I.D.C. Nanyuki Location S. 1 : 50,000

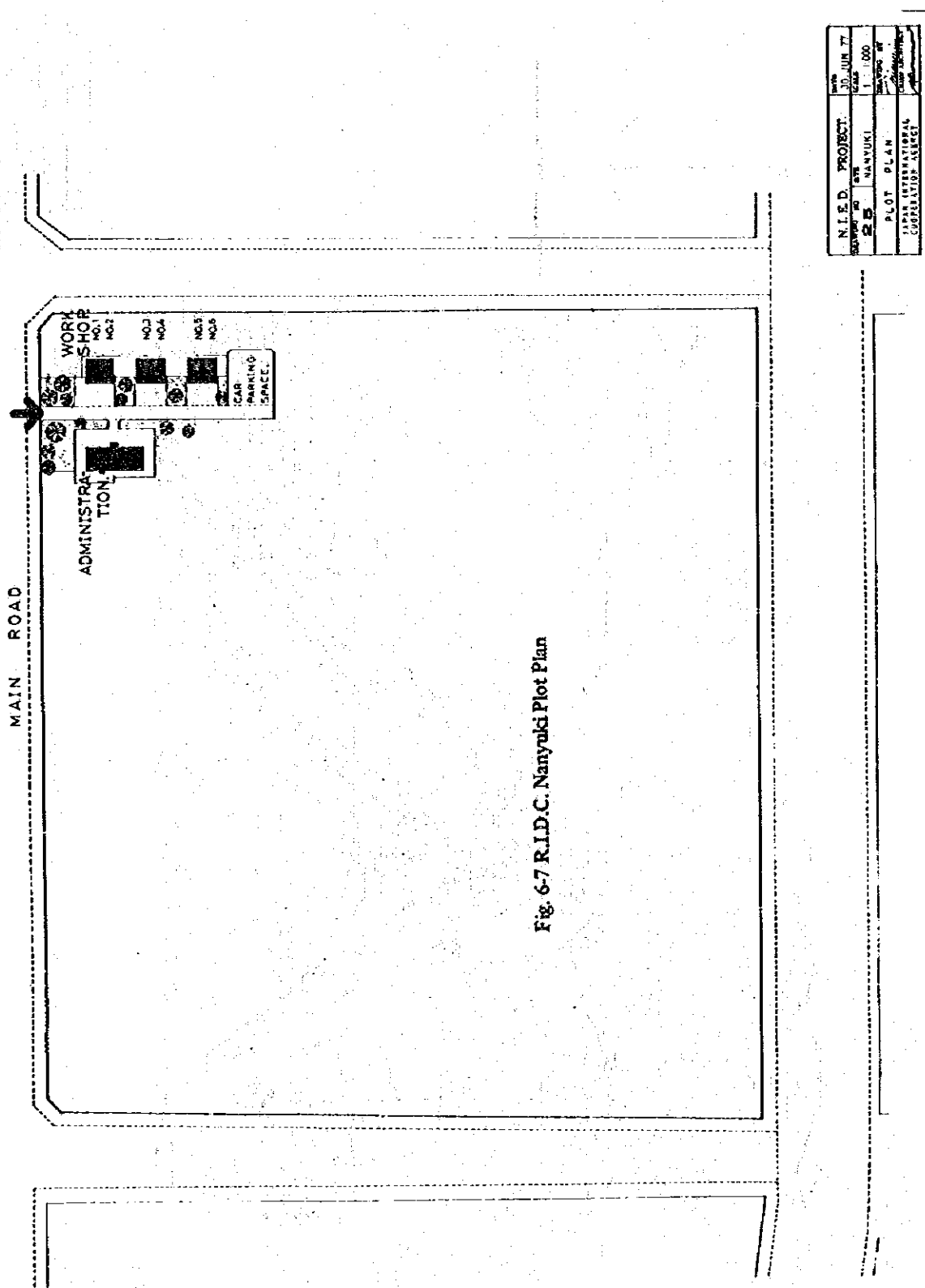


Fig. 6-7 R.I.D.C. Nanyuki Plot Plan

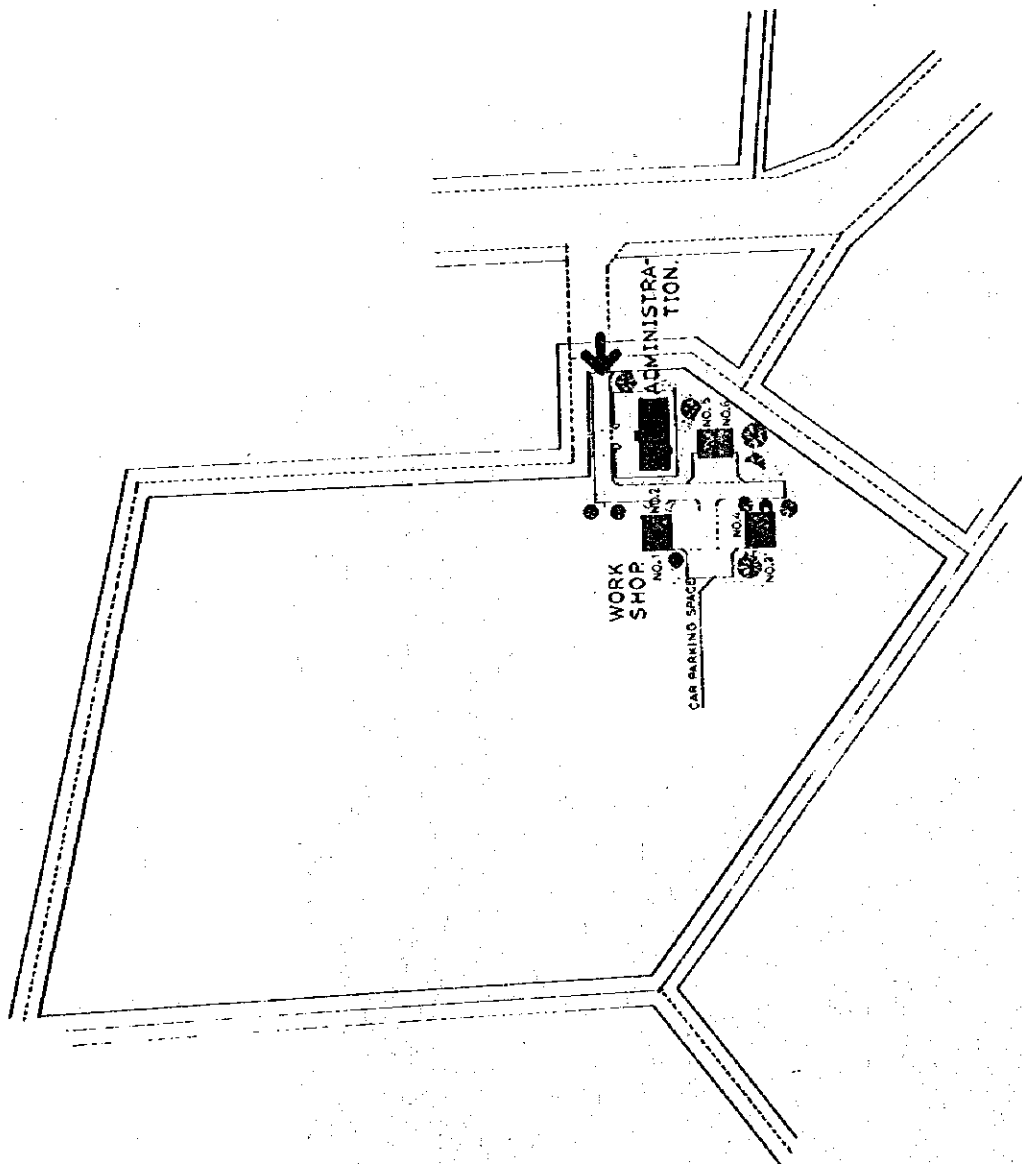
DATE	30 JUN 77
N.I.E.D. PROJECT	
SCALE	1 : 1000
NO	25
BY	NANYUKI
PLOT PLAN	
JAPAN INTERNATIONAL COOPERATION AGENCY	



Fig. 6-8 R.I.D.C. Muranga Location

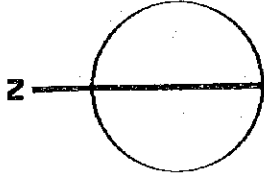
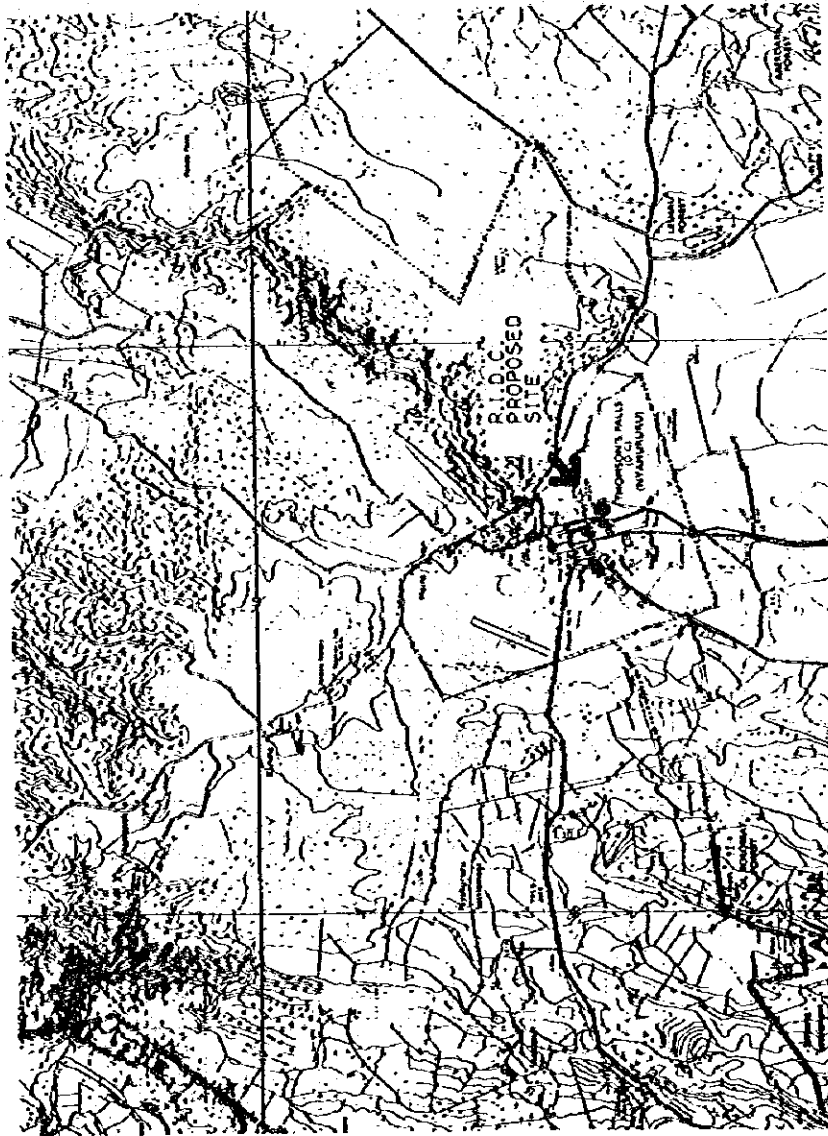
S. 1 : 50,000

DATE	30 JUN 77
V.T.E.O. PROJECT	200
DRAWING NO.	25
LOCATION	MURANGA
JAPANESE INTERNATIONAL COOPERATION AGENCY	



N.I.E.D. PROJECT:	DATE
27	30 JUN 77
MURANGA	SCALE
1:100	1:100
PLOT PLAN	DESIGNED BY
INTERNATIONAL	DATE
CONSULTING AGENCY	

Fig. 6-9 R.I.D.C. Murunga Plot Plan



N.I.E.D. PROJECT:	30 JUN 77
LOCATION:	NYAHURURU
SCALE:	1" = 50,000'
DATE:	1977
BY:	CHIEF ENGINEER
FOR:	JAPAN OPERATIONAL COOPERATION AGENCY

S. 1 : 50,000

Fig. 6-10 R.I.D.C. Nyahururu Location

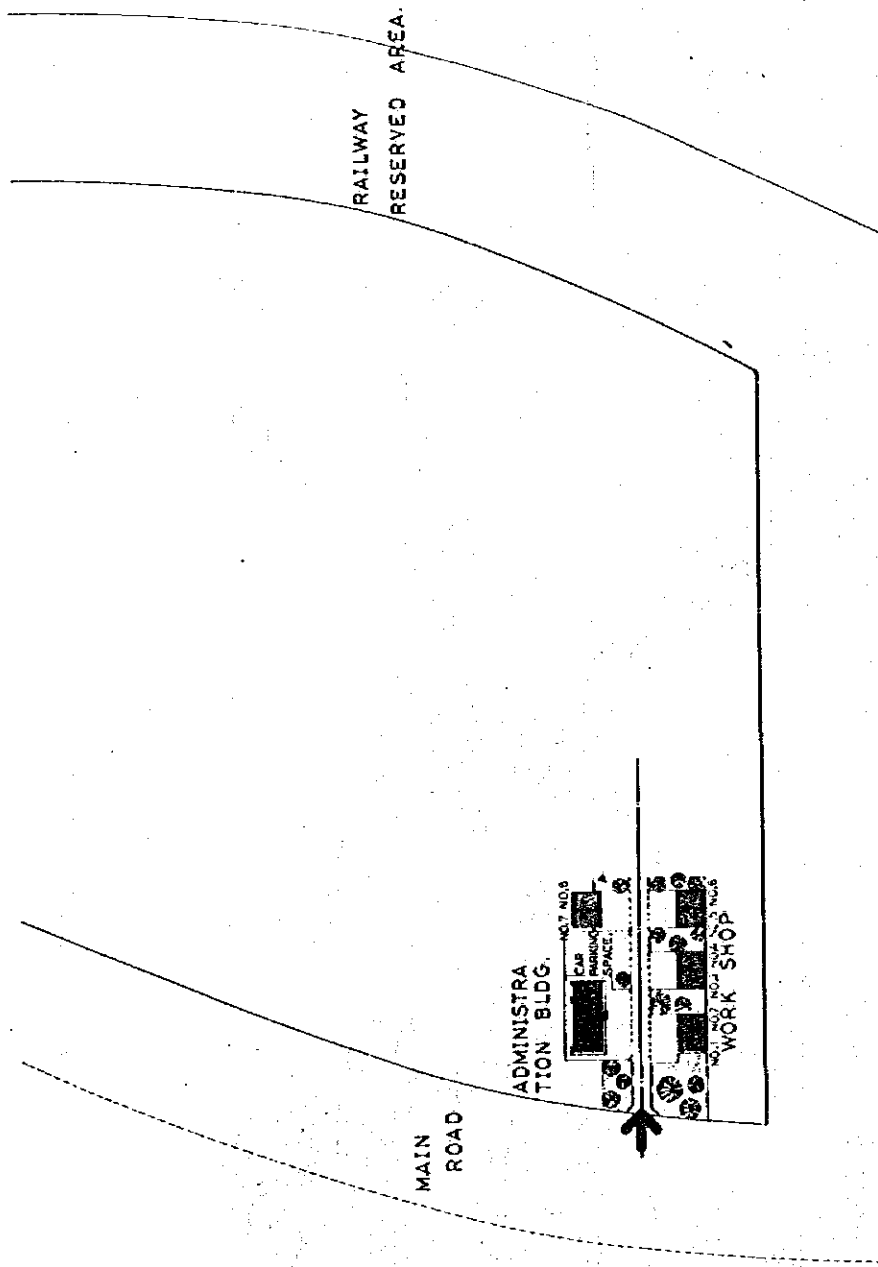


Fig. 6-11 R.I.D.C. Nyafururu Plot Plan

N.I.E.D. PROJECT:	30 JUN 77
DATE OF PLAN:	1977
SCALE:	1:100
PLOT PLAN	
ADMINISTRATIVE	
CONSTRUCTION	



BACK ELEVATION

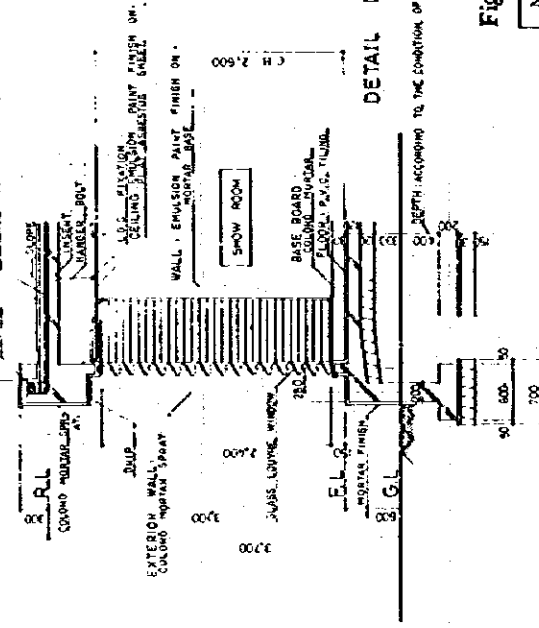
SIDE ELEVATION



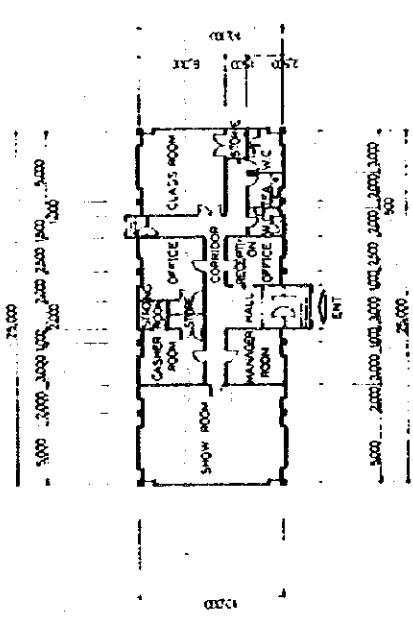
FRONT ELEVATION

SECTION

ROOF: WATER PROOF MORTAR FINISH ON LIGHT CONCRETE.
 JAMBAL: IMPREGNERIZATION IN MORTAR



DETAIL DRAWING



PLAN

AREA 250 m²

Fig. 6-12

N.I.E.D. PROJECT.	DATE
30	30 JUN 77
R.I. DC ADMINISTRATION	SCALE 1:100
JAPAN INTERNATIONAL COOPERATION AGENCY	

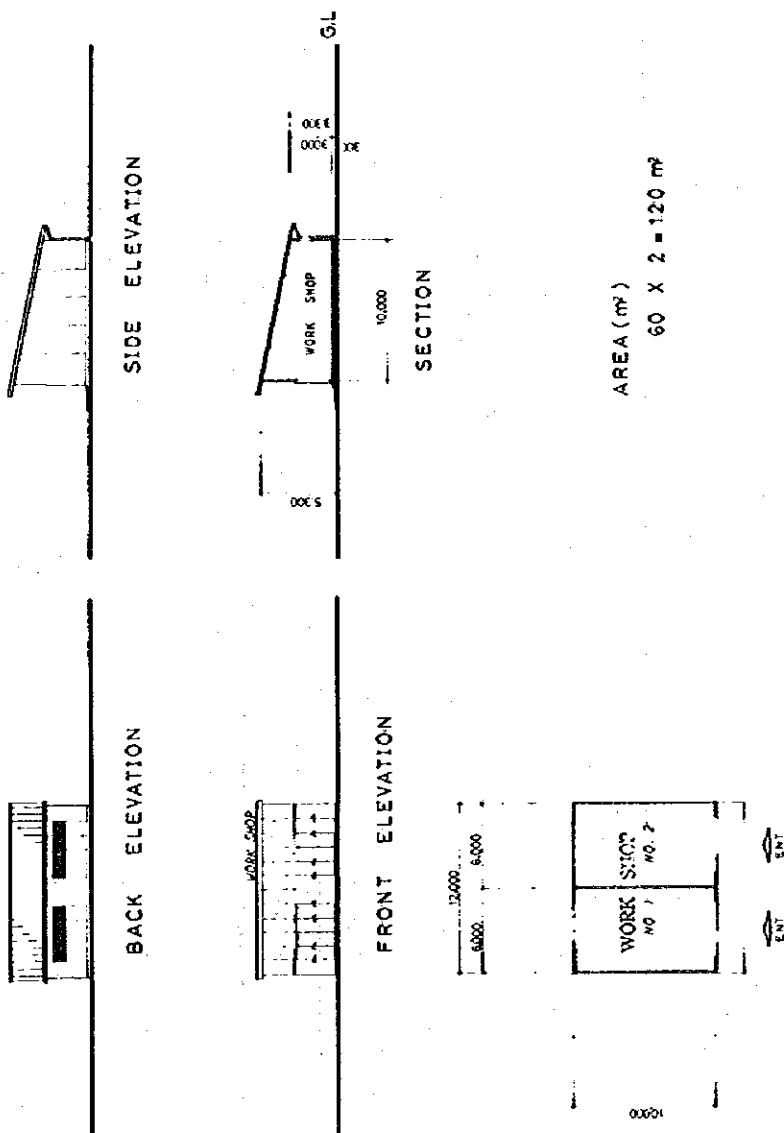


FIG 6-13

N.I.E.D. PROJECT	DATE
31	10 JUN 77
R.I.D.C. WORK SHOP	SCALE
JAPAN INTERNATIONAL COOPERATION AGENCY	1:200

Chapter 7

Management System for Industrial Development in Nyeri Region

7-1 Basic Concept

The purpose of the Nyeri regional industrial development plan is to produce a new industrial structure for the region through the encouragement and development of small factories, thereby contributing to the social and economic development of the region as a whole; one important strategic feature of this development plan is the premise of a system which can concentrate the geographically scattered markets on Nyahururu, Nanyuki, Muranga, Karatina, and, at the center, Nyeri, with a planned management system.

In other words, the concept of the Nyeri set-up is to control the growing process on the economy in Nyeri Region and promote the development through a total system encompassing every industrial development project in the region together with local systems working through the R.I.D.C.s, industrial estates, and other agencies and organizations located in the various districts.

At present the Nyeri region cannot necessarily be said to offer a firm industrial foundation or an abundant market. Accordingly, in order to foster an industrial foundation, aiming particularly at small factories, it can be thought that appropriate strategies would be necessary for the expansion of markets to some possible economic scale, and it would be also necessary that these localized markets are controlled under a common purpose.

Based on such premises, it is possible to control the industry of Nyeri, Nyahururu, Nanyuki, Muranga, Karatina, and other areas so that they have their own economic spheres in accordance with their own amassed potentials but at the same time do not compete within the market of the Nyeri region as a whole. The economic scale within such areas will also act as factors promoting the expansion of the economies of other areas within the Nyeri region, and based on this process of development, small factories can be expected to develop and lead to the take-off process for the region's advancement.

In other words, in carrying out the development plan, the following become necessary to fulfilling the following conditions:

- (1) Provision of the energy to initiate the development.
- (2) Creation of an environment in which the process of development can lead to autonomous systems.

It is necessary for the management of the plan to maintain these conditions as a function of the operation of the plan.

Regarding point (1) above, the introduction of the funds generally at low interest would be expected. The use of such funds can be considered in, for example, the following ways.

1. Improvement of the infrastructure.
2. Financing for plant and equipment investment, operating funds to entrepreneurs.

3. Investment for the rationalization of technical instruction, management guidance, and other company activities.

These can be summarized under two headings.

- Direct investment in companies that can serve as a leading force of industrialization.
- Investment for the provisions of conditions needed for industrialization.

In the former of these two, those industries that can be expected to have expanded effects on the regional economy will probably be given preference, and for the latter, extremely close consideration must be given to expansion of the benefit to local economy through provision of such conditions as well as to effective use of the available funds. Needless to say, the concept of gathering together a number of enterprises in an industrial estate also adheres to basically the same approach.

Regarding point (2), this point refers to the organized distribution of benefits being assured through the integration of localized markets when the operation of a single enterprise cannot deal with the market in a greater economic sphere.

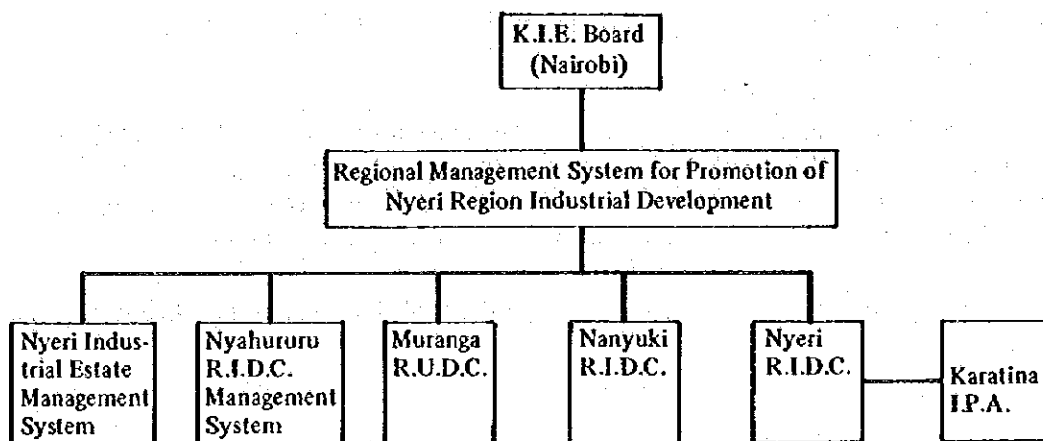
The profits derived from the effective use of such funds and the organization of the region brace up the internal economy as far as the region is concerned and the external economy as far as the enterprises are concerned, and the Nyeri regional industrial development plan must be developed in keeping with such an approach.

In this way, in order to optimize the functional sub-systems (in this case, the various local systems) comprising the overall system, the system of control and management tying together the overall system (the Nyeri region) should fulfill the following major functions.

1. Formulation of plans and preparation of development programs.
2. Carrying out and controlling programs (conduct of system in each district).
3. Adjustment and optimization of programs through feedback from actual performance.

Particularly in regard to the formulation of the development program. It is necessary to make up the plan from a standpoint of the benefits offered by organization in terms of the characteristics of the region, amassed potential, effective use of existing resources, incorporation between enterprises and between regions, determination of the contents of industries, and the like, so that it is essential to provide the staffing needed to make such studies and plan formulation possible.

From the above, it would be desirable to follow the concept of the set-up for Nyeri industrial development and to manage this program through the structure illustrated following.



7-2 Management System

i) Regional management system (R.M.S.)

This system has its function the overall operation and management of Nyeri industrial development, and it conducts managerial control over each of the local systems in Nyeri region, the Nyeri industrial estate, the R.I.D.C.s of Nyahururu, Nanyuki, and Muranga, and the Karatina I.P.A.

As the body tying together all of the K.I.E. activities being undertaken in the Nyeri region, the organization centers around the regional manager, and the staff is composed of the accountant-economist, regional planner, industrial-economist, and other. It is also desirable that it have advisors to assist in important specific themes.

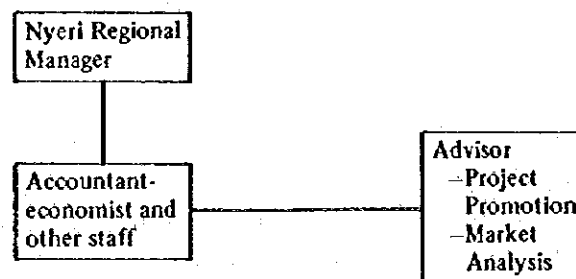
The following can be considered as the main activities of the R.M.S.

- (1) Preparation of Nyeri region industrial development programs.
- (2) Conducting the surveys and studies necessary to formulate such programs.
- (3) Control at the regional level of production, distribution, markets, etc.
- (4) Control and guidance of the management of the various R.I.D.C.s and industrial estates carrying out the development programs.
- (5) Short- or long-term assignment of advisors and the like in response to the staffing or the various agencies and local demand.
- (6) Adjustment of accounting records for operations at each level and for the region as a whole.
- (7) Provision of financing to enterprises for plant and equipment investment, etc., and control of the repayment of such loans.
- (8) Inducement and selection of appropriate enterprises.
- (9) Strategic response to markets in and competition with other regions.
- (10) Promotion of linkage with medium- and large-scale industries.
- (11) Preparation and execution of organized programs for technical guidance, managerial guidance, etc.
- (12) Domestic and international public relations activities for the region's industry.

- (13) Establishment and effective use of an information network tying together the various districts.

From the above, it is also desirable that the manager of each of the R.I.D.C.s and industrial estates be included in the R.M.S. staff. In addition, it is also desirable that there be an industrial economist available as advisor to deal from the start with the important question of which kinds of industrial development are most critical to progress in the region.

Furthermore, it would be appropriate for the R.M.S. to locate its office within the Nyeri industrial estate.



ii) *Nyeri industrial estate management system*

This management system shall be organized around the estate manager and shall exercise general control over the industrial estate. Its activities shall include the following:

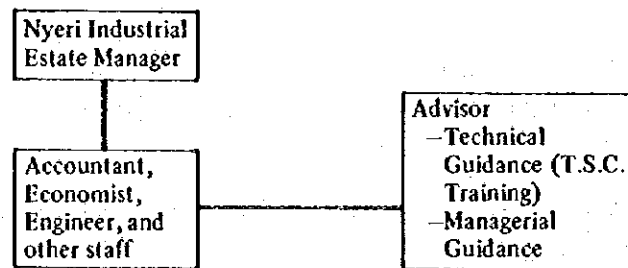
- (1) Formulation of planning and designs for the industrial estate.
- (2) Control and execution of construction.
- (3) Cooperation with the R.M.S. in selection of enterprises for location in the estate.
- (4) Managerial guidance for the enterprises.
- (5) Selection and proposal of the machinery and facilities needed by the enterprises.
- (6) Evaluation of necessary and appropriate financing and cooperation with the R.M.S. in the execution and control of such financing.
- (7) Selection and provision of equipment needed by the T.S.C.
- (8) Technical guidance through the T.S.C.
- (9) Management of the canteen, utilities, and other common facilities.
- (10) Provision of the R.M.S. with information on the district's production, distribution, markets, etc.
- (11) Provision of the R.M.S. with materials on the status of the industrial estate's operations.

In keeping with the above, the organization should consist of those staffs as an accountant, economist, engineer, etc., and it is also necessary to have experts in technical guidance to serve as advisors.

With the exception of the advisors, the following can be considered an appropriate proposal for K.I.E. staffing.

1. Estate manager	1
2. Economist	1
3. Engineers	2
4. Steno-typist	1
5. Accountant	1
6. Clerical officer	1
7. Telephone/receptionist	1
8. Stores clerk	1
9. Messengers	2
10. Station hands	2
11. Driver	1
12. Watchmen	2
13. Foreman	1
14. General mechanics	2
15. Electrician	1
16. Machine operator-turner fitter	2
17. Unskilled workers	2

Moreover, in light of the relationship between the Nyeri industrial estate and Nyeri R.I.D.C., it is necessary that it use a rational system involving such features as sharing of the T.S.C. and R.I.D.C. workshops and joint use of advisors for technical guidance, etc. Since the industrial estate management system occupies the same offices as the R.M.S., rationalization of staffing can also be sought through this relationship.

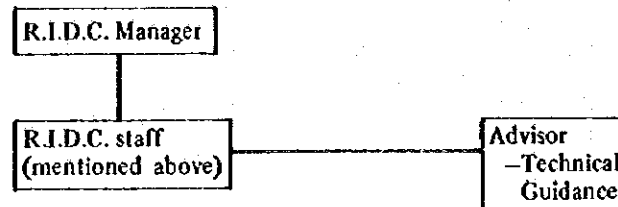


The following presents a proposal for the staffing of the K.I.E.

1. Central manager	1
2. Shorthand typist	1
3. Bookkeeper	1
4. Clerical officer	1
5. Stores clerk	1
6. Drivers	2
7. Telephone/receptionist	1
8. Leather technician	1
9. Mechanical engineer	1
10. General mechanic	1
11. Field officer-wood work	1
12. Wood work technician	1
13. Sheet metal technician	1
14. Field officer-metal work	1
15. Unskiller worker	1
16. Spray painter	1
17. Pottery technician	1
18. Station technician	1
19. Messenger	1
20. Watchmen	2

iii) *R.I.D.C. Management system*

For the general management of the R.I.D.C. (in the case of the Nyeri, also including the Karatina I.P.A.), the organization is as described in Chapter 6, centered on the R.I.D.C. manager.



7-3 **Nyeri Industrial Development Program**

The main activities in industrial development of Nyeri are as follows:

1. Provision of industrial foundation.
2. Financing of enterprises' plant and equipment investment.
3. Establishment of system for guidance in technology and management.

Point 1 involves the establishment of the Nyeri industrial estate, Nanyuki R.I.D.C., Muranga R.I.D.C., Nyahururu R.I.D.C., and Karatina I.P.A. and the provision of related infrastructure.

Point 2 involves the financing of production machinery and other facilities necessary to enterprises entering the Nyeri industrial estate and financing of registered enterprises of the various R.I.D.C.s.

Point 3 involves the assignment of expert technical advisors to the R.M.S., the industrial estate, and the R.I.D.C.s.

The above represents the contents of the various operations in the industrial development program. The Nyeri industrial development and the Nyeri set-up are plans which expect to derive benefit through the overall organization of the region and which seek to generate the take-off to economic development, and they are plans which seek to provide the basics of an industrial foundation. Thus, insofar as is possible, it is desirable for the set-up to be achieved.

i) *R.M.S. development program*

Study is being conducted on a proposed program which would have the completion of the Nyeri set-up achieved during the ten years from 1977 to 1986.

When the R.M.S. is considered as the organization that would tie together all the Nyeri industrial development activities, it becomes urgent to formulate the implementation program for such development. For this purpose, it is thus necessary for the K.I.E. to urgently select a Nyeri regional manager and the major staff and formulate a master plan for development and an implementation program.

Meanwhile, in order to establish the contents of the industry for such development, it is desirable that the selection of the concerned industries be begun, including studies of the orientation of the markets concerned, through the cooperation of the advisor.

As an advisor, it is appropriate to use a specialist with expertise in the field of industrial economics. Since the R.M.S. office is established within the Nyeri industrial estate, it is desirable that the R.M.S. project team be formed and located in the Nairobi K.I.E. or the Nyeri R.I.D.C. to perform the above-mentioned activities before the establishment of the industrial estate. It can be thought that in 1979, following the establishment of the R.M.S. office, the R.M.S. can begin all of its activities in Nyeri region.

ii) Nyeri industrial estate development program

It is desirable that the civil engineering and works related to utilities be completed by FY 1979, including the design period. Following the construction of the above, in FY 1980, it is necessary for the machinery needed by the T.S.C. be installed, preceded by the assignment of advisors for technical guidance and the selection of the T.S.C. machinery, taking into account the characteristics of the region and the demand for the location of specific industries. It is assumed that the enterprises concerned will enter the estate during the five year period of FY 1980 through FY 1984, and that advisors will be available to give managerial guidance to estate enterprises for an eight-year period, including the year before the beginning of location in the estate, FY 1979, through two years after the entry period.

Financing for the enterprises in the estate can be considered to be generated by the level of progress in entry of enterprises.

iii) Nyeri R.I.D.C. development program

The facility itself has already been completed, but the machinery and equipment installed cannot yet be called sufficient. What is important for the R.I.D.C. is the provision that can answer immediately to the demand in the district, and to make this possible, it is necessary to assign an advisor and take other steps in technical guidance, including the optimum selection of machinery and facilities.

Furthermore, the advisor to the R.I.D.C. should be made available in principle for four years, including two years of planning and construction and the following two-year period.

In the case of the Nyeri R.I.D.C., the advisor should be available according to plans until FY 1979, and it is desirable that he provide guidance in the planning and design of the Karatina I.P.A. during this period.

iv) Karatina I.P.A. development program

Regarding the amassed industry in the Karatina district, a survey has already been conducted, and sufficient study has been given to the establishment of the Karatina I.P.A. Thus, insofar as is possible, it is desirable that its construction be conducted at an early period. In addition, the management of the Karatina I.P.A., including its construction, should be exercised by the Nyeri R.I.D.C.

v) *Development program for Nanyuki, Muranga, and Nyahururu R.I.D.C.s*
Study has been made of the construction in the order Nanyuki, Muranga, and Nyahururu, but the formulation of the R.M.S. operations program must be accompanied by a thoughtful restudy of this matter.

In general, one condition for an R.I.D.C. is the compatibility of the service it offers and the characteristics of the district, and in this sense it is necessary to follow the appropriate advice of the advisor in drawing up plans. For example, it is pointed out that in the case of the Nanyuki R.I.D.C., the characteristics of the district do not require the R.I.D.C. to have workshops (see Chapter 6).

The conditions for the advisors to these R.I.D.C.s are the same as for the Nyeri R.I.D.C.

The above development programs are illustrated in the following table:

7-4 Expenses for Development

The investment necessary to the Nyeri region industrial development plan fall under the following headings:

Construction

Expenses for the construction of the Nyeri industrial estate, Nyeri R.I.D.C., Nanyuki R.I.D.C., Muranga R.I.D.C., Nyahururu R.I.D.C., and Karatina I.P.A.: regarding the Nyeri industrial estate, expenses for related infrastructure in the vicinity of the estate.

Machinery and facilities

Expenses for machinery and facilities for the Nyeri industrial estate T.S.C. and the various R.I.D.C. workshops.

Financing

Expenses for financing of plant and equipment investment, etc., by the industrial estate, enterprises setting up therein, and enterprises participating in the R.I.D.C.s.

Maintenance and control

Administrative costs needed for the maintenance and control of the various systems; however, since the R.M.S. represents the K.I.E. in its headquarters functions, its maintenance costs are to be procured from the K.I.E.

Assignment of expert advisors

Personnel expenses for advisors for the various systems, including the R.M.S., and as otherwise necessary.

The above expenses are estimated as in the following table.

NYERI INDUSTRIAL DEVELOPMENT PROGRAM (ASSIGNMENT OF CONSTRUCTION AND ADVISORS)

	FY 77	FY 78	FY 79	FY 80	FY 81	FY 82	FY 83	FY 84	FY 85	FY 86
NYERI SET UP										
R.M.S. REGIONAL MANAGEMENT SYSTEM		Project Team (KIE, Nairobi)	Project Team (Nyeri)				Regional Management Office			
INDUSTRIAL ESTATE NYERI		Design & Construction	Design & Construction	Machinery Installed (T.S.C)	Tenancy Begins	Advisor : B (Mechanical Engineer)	Advisor : C (Business Consultant)	Tenancy Completed		
R.I.D.C NYERI		Advisor : B								
I.P.A KARATINA			Design & Construction							
R.I.D.C NANYUKI			Design & Construction	Advisor : D (Mechanical Engineer)						
R.I.D.C MURANGA				Design & Construction	Advisor : E			(Mechanical Engineer)		
R.I.D.C NYAHURURU								Design & Construction	Advisor : D	

ESTIMATION OF PROJECT COST

(\$ million)

— Summary Table —

	R.M.S	NYERI I.E	NYERI R.I.D.C	NANYUKI R.I.D.C	MURANGA R.I.D.C	NYAHURURU R.I.D.C	KARATINA I.P.A
CONSTRUCTION ACCOUNT							
LAND PURCHASE	0	0	0	0	0	0	0
CONSTRUCTION	0	1.343	0	0.148	0.144	0.143	0.081
SURVEY & DESIGN	0	1.201	0	0.022	0.022	0.021	0.012
SUB TOTAL	0	1.544	0	0.170	0.166	0.164	0.093
RELATED PUBLIC WORKS	0	0.425	0	0	0	0	0
MACHINERY INSTALLATION							
COMMON MACHINERY	0	0.200	0.020	0.040	0.040	0.040	0
TOTAL (ABOVE)	0	2.169	0.020	0.210	0.206	0.204	0.093
FINANCIAL ACCOUNT							
MACHINERY & WORKING CAPITAL	0	1.000	0.150	0.075	0.110	0.110	0
MAINTENANCE ACCOUNT							
MAINTENANCE & MANAGEMENT	0	0.096/Y	0.084/Y	0.084/Y	0.084/Y	0.084/Y	0
ADVISOR SURVICES							
0.045 / P.Y	10 P.Y 1 Person 10 Years	16 P.Y 2 Person 8 Years	2 P.Y 1 Person 2 Years	4 P.Y 1 Person 4 Years	4 P.Y 1 Person 4 Years	4 P.Y 1 Person 4 Years	0
	0.450	0.720	0.090	0.180	0.180	0.180	0

Expenses for Nyeri industrial estate

(A) Construction Expenses

Calculations have been made based on the proposed draft plan for the Nyeri industrial estate. The method of calculation, range of the calculated estimates, and the results of the estimate calculations are as follows:

(a) Method of Rough Calculation

The rough calculation of expenses for the works in this plan are based on reports of hearings with consultants from private construction companies in Nairobi and collected data, corrected as appropriate in light of records from existing industrial estates, local calculation materials (Construction Cost Index, 1975), etc.

–Civil Engineering

Grading

Operations within the site were calculated dividing them into dirt removal and filling, and to find the cost of each, calculations were converted into units of square meters.

Road work within site (paving)

Calculated by subtracting planted area and building area from the total area of the site.

Planting

Calculated from the estimated area involved.

–Construction

This total floor space by type of structure was sought, and the construction works were divided into the various types of construction and facilities Related facilities outside of the estate

Estimated from the type of work, number of persons involved, scale of construction, and area.

Miscellaneous construction (fences, gates, etc.)

Estimated from the planned total circumference of the site.

(b) Range of rough calculations

1. Cost of land purchase is excluded from calculations.
2. Calculations of the various facilities are limited to the K.I.E. proposed site, and the extension area is excluded.
3. For the I.P.A. and R.I.D.C.s, the range was taken into consideration in keeping with the appended illustrations.
4. Electrical facilities were calculated only for electrical reception facilities within the utility site, and work outside the site was considered separate work (provision of infrastructure).
5. For water facilities, calculations were made for water reserve tanks, pumping facilities, and pipe laying within the site, and work outside the site was considered separate work (provision of infrastructure).
6. Treatment facilities were calculated as simple water treatment facilities, soakage pits, and trash burners.
7. Communications facilities were calculated as telephone switchboards and telephones.

8. Other expenses exclude the expenses for installation and connection of water, electricity, telephones, etc.
9. Design expenses and administrative expenses are taken to be 15% of total expenses.
10. One ksh was taken to equal 40 yen at one US\$=¥270.
11. Materials from abroad paid for in foreign currency are handled at F.O.B. cost, and marine transport costs and domestic transport costs are not included.

(c) Results of rough calculations

The results of the rough calculations are as given following. (Table 7-1)

Expense Item	Contents of Expense
Land acquisition	Since the site planned for use is part of the municipal lands of Nyeri, no particular land acquisition costs have been calculated.
Construction	
–Civil engineering	Including expenses needed for grading, road works, paving, and planting.
–Construction	Expenses for construction of administration building, canteen, T.S.C., and ten standard workshops.
–Facilities construction	Expenses for construction of facilities for the structures given above.
–Other construction	Expenses needed for fences, gates, water drainage (ten pipes laid within site), water supply (pipe laying within site), electrical facilities (transformers, panel board, wiring), communications facilities (P.B.X.s, telephones), water pollution facilities (water treatment tanks), water pumping facilities.
Surveys, design	Expenses for designing, etc., after the basic plan.
Provision of related infrastructure	Electrical facilities—Expenses for electrical transmittal facilities (approx. 8 km) from Kiganjo transformer station (including installation of step-down transformer within district).
(Separate works)	Water supply facilities—Expenses for drawing water from Muringato River (approx. 600 m), water supply pumps, water treatment equipment, etc.
(Work outside estate)	Water piping facilities for transfer of treated water to Muringato River (approx. 600 m), and expenses for piping (excluding piping within wite).

Table 7-1 Construction Cost Breakdown for Nyeri Industrial Estate

Work	Type of Work	Area, Length, etc.	Unit cost	Amount	Remarks
1. Civil engineering	a) Land grading, etc.	48,820 M ²	US\$ 1.1	US\$ 53,702	
	b) Road work	8,124 M ²	18.5	150,294	
	c) Paving	12,400 M ²	7.4	91,760	
	d) Flora	22,124 M ²	1.3	28,761	
	Sub-total			324,517	
2. Construction	a) Administration Bldg.	360 M ²	US\$ 222	US\$ 79,920	
	b) Canteen Bldg.	192 M ²	185.2	35,558	
	c) T.S.C.	420 M ²	51.9	21,798	
			22.6	9,492	Steel reinforcements 10 tons
	d) Shed	5,200 M ²	56.3	292,760	
		22.6	117,520	Steel reinforcements 130 tons	
Sub-total			557,048		
			Δ557,000		
3. Construction facilities	a) Administration Bldg.	360 M ²	US\$ 55.6	US\$ 20,016	Interior wiring
	b) Canteen Bldg.	192 M ²	46.4	8,909	Lighting
	c) T.S.C.	420 M ²	18.5	7,770	Elec. sockets
	d) Shed	5,200 M ²	18.5	96,200	Water supply & discharge facilities
	Sub-total			132,895	fire extinguishers
			Δ133,000		
4. Others	a) Fence gates	1,100 M	US\$ 37	US\$ 40,700	
	b) Water discharge (φ6" steel pipe) Installation	1,070 M	6.7	7,169	
		1,070 M	17.5	18,725	
	c) Water supply (φ82" steel pipe) Installation	1,420 M	1.9	2,698	
		1,420 M	5.6	7,952	
	d) Elec. reception Installation	1 set		185,185	
		1 set		27,778	Elec. panel band, Transformer, Fence, Foundation
	e) Communications facilities Installation	1 set		9,259	Switch board & telephones
		1 set		3,704	
	f) Simple water treatment tanks Incinerator Collection tank Soakage pits	1 set		18,519	
g) Water pumps Installation	2	1,852	3,704		
	1 set		1,852		
Sub-total			327,245		
			Δ327,000		
	Total		US\$1,342,000		
5. Administrative expenses	Expenses x 15%		US\$ 201,000		
	Grand Total		US\$1,543,000		

Work	Type of Work	Area, Length, etc.	Unit cost	Amount	Remarks
6. Separate works	(Provision of infrastructure)				
	a) Elec. trans.				
	1. Poles	8,000 M	US\$ 6.3	US\$ 50,400	
	2. Wiring	8,000 M	18.5	148,000	
	3. Installation	8,000 M	10	80,000	
	Sub-total			278,400	
				Δ278,000	
	b) Water supply facilities				
	1. Water pipe (φ32)	600 M	US\$ 8.9	US\$ 5,340	
	2. Installation	600 M	5.6	3,360	
	3. Treatment facilities (200t/day x 3 = 600t/day)	3	33,000	99,000	
	4. Installation	1 set		3,704	
	5. Water pump	1 set		3,704	(2)
	6. Installation	1 set		1,852	
	7. Installation costs	60 M ²	111	6,660	
	c) Water discharge (RC fume pipe 250φ)	600 M	37	22,200	Materials costs
	Sub-total			US\$145,820	
				Δ146,000	
	Total			US\$424,000	

(B) Expenses for Machinery and Facilities

The breakdown of expenses needed for machinery and facilities required by the T.S.C. includes one set each of machinery, tools, measuring instruments, spare parts, and training machinery.

- Machinery
Engine Lathe, milling machine, drill press, grinder, etc.
- Tools
Twist drill, tap, milling cutter, spanner, universal file, etc.
- Measuring instruments
Micrometer, vernier calipers, etc.

Total = US\$600,000

(C) Financing

Financing consists of financing for investment in plant and facilities by enterprises in the industrial estates, playing an important role in industrial development activities.

In building up small-scale industry in agricultural areas, it is generally thought that the important points lie in providing infrastructure through the construction of industrial estates, technical and managerial guidance to the industries concerned, and technical training service, but in addition, an essential element in the promotion of industrialization is financing of funds for industrial promotion and the purchase of machinery and facilities.

The K.I.E., in order to fulfill these conditions, has in the past purchased machinery and equipment for the enterprises entering the industrial estates and then leased these to the enterprises. This has represented one incentive to the enterprises entering the industrial estate. Through the R.I.D.C., it has also carried out lending operations for enterprises outside the estate which are registered with the R.I.D.C. primarily for their purchase of machinery and facilities.

It is thus very important for the operations of the K.I.E. that it possess the funds for such financing activities for enterprises. The result of the K.I.E.'s fostering and promotion of small industry has been marked by the demand for financing from such industries, and this has in turn led to the improvement of the financial performance in K.I.E. operations.

The agency superior to the K.I.E. is the I.C.D.C., and this carries on financing activities for the enterprises, but such financing is in different territories from that of the K.I.E. The target of I.C.D.C. financing is projects of a scale larger than that handled by the K.I.E., and thus in principle it divides industries into small industries (or craft industries handled through the R.I.D.C.) and, on the other hand, medium and large industries. (There are, however, many cases where a clear dividing line cannot be drawn.)

Under the regional manager, the K.I.E. seeks to offer an organization that will promote comprehensive, coordinated industrialization by region, and amidst such circumstances, financing for the industrial projects mentioned above has been placed under the overall coordination of the K.I.E. This is a matter that has bearing on the K.I.E.'s future operational strategies, and in this study, we would like to refrain from dealing with this matter.

Here, it is possible to divide financing activities for enterprises into a number of fields, and this study deals only with those fields essential to the development of industrial estates.

First, turning to the types of financing, one type is financing of funds for purchase of machinery and facilities and operating funds. Operating funds can be considered very important in terms of promoting enterprises poor in their own capital and is thus essential in the area of establishing and developing small industries in rural areas.

Next is the enterprises taken as the subject of financing. In the narrowest definition, such enterprises are those entering the industrial estates, and it is also possible to expand this to include those enterprises registered with the R.I.D.C.s. In addition, the broadest definition would include all industrial projects within the whole region.

	Funds for Purchase of Machinery and Equipment	Operating Funds
Enterprises entering industrial estate	A	B
R.I.D.C. registrants	C	D
Enterprises within area	E	F

Target regions (broad definition) $\left\{ \begin{array}{l} (1) \text{ A} \\ (2) \text{ A + B} \\ (3) \text{ A + C} \\ (4) \text{ A + B + C + D} \end{array} \right\}$ Areas directly related to development of industrial estates

Among these various target areas, those essential to industrial estate development operations are financing of machinery and facilities for enterprises entering the industrial estates and financing of operating funds. In the case of the industrial estate for the Nyeri district, it is essential to estimate from the present status what level of funds demand there will be for such financing. This is because it is still impossible to determine the types and scale of project to be introduced.

As reference materials for the rough calculation of necessary operating funds

for Nyeri industrial estate development, estimates have been made of the amounts of funds necessary for purchase of machinery and facilities for enterprises in the industrial estates, using two different approaches. The first approach is estimates based on the experiences of enterprises already established in other industrial estates. The second approach supplements the above with assumptions about the contents of operations of a number of projects assumed to be introduced into the industrial estate, estimating the machinery and facilities costs therefrom.

First, let us look at the financing records of loans to enterprises in the existing industrial estates and the R.I.D.C.s.

According to the K.I.E. operating reports regarding financing in the two existing industrial estates and four R.I.D.C.s, financing has been conducted as shown in Table 7-2. The Eldoret industrial estate is currently under construction, and only one enterprise has been decided for location therein. Moreover, this is a comparatively large paper plant, so that the amount of financing per enterprise is large. As shown in Table 7-3, when all enterprises in the two industrial estates are considered, the average amount of financing per company becomes US\$30,000.

Next we sought to prepare a list of companies receiving loans in decreasing order of financial size of the projects. According to this list, the average for large-scale financing projects (A) of \$200,000 or more was approximately \$300,000. For medium-size financing (B), the average was \$114,000, and for relatively small projects, the average amount of financing was \$32,000. (See Table 7-4.)

In the case of the Nakuru industrial estate, financing by the K.F.W. was for purchase of machinery alone, and this was applied along with financing of local costs and working capital by the I.C.D.C. The amount disbursed as given in Table 7-5 is the total of these two types of financing. It is not possible to divide financing by company into K.F.W. financing and I.C.D.C. financing, but in the total amount of loans as shown in Table 7-6, including both K.F.W. financing and I.C.D.C. financing, 68.5% represents K.F.W. financing. In the case of the Nakura estate, the amount of K.F.W. financing (funds for machinery purchases) was an average of \$53,000 per company.

Table 7-2 K.I.E. Loan Record to Enterprises (Estate and R.I.D.C.)

Type	A. No. of enterprises	B. Approved amount	C. Amount disbursed	B/A (ksh)	C/B (%)
Kisumu Estate	15	2,188,412	1,404,512	145,894	64
Eldoret Estate	1	1,709,180	1,606,992	1,709,180	94
Kakamega R.I.D.C.	10	3,594,289	2,548,441	359,429	71
Embu R.I.D.C.	13	2,743,130	1,625,929	211,010	59
Nyeri R.I.D.C.	29	885,942	824,127	30,550	93
Machakos R.I.D.C.	18	310,546	289,086	17,253	93
TOTAL	86	11,431,499	8,299,087	132,924	73

Table 7-3 Loans to Enterprises in Industrial Estates (Eldoret and Kisumu)

Type	A. No. of enterprises	B. Approved amount	C. Amount disbursed	B/A (ksh)	C/B (%)
Farm Machinery	1	170,400	90,000	170,400	53
Metal Works	3	123,000	85,000	41,000	69
Clothing Factory	4	454,512	416,012	113,628	92
Leather Works	1	200,000	75,000	200,000	38
Confectionery Products	1	788,000	400,000	788,000	51
Craft Paper	1	1,709,180	1,606,991.9	1,709,180	94
Plastic Goods	1	140,000	140,000	140,000	100
Handicraft	1	8,500	8,500	8,500	100
Carpentry	3	304,000	190,000	101,333	63
TOTAL	16	3,897,592	3,011,503.9	243,599.5 (243,599 ksh = 30,450 US\$)	77

Table 7-4 Loan Record to Enterprises in Industrial Estates

Type of Industry (estate)	Loan disbursed	(8 ksh/US\$)
A Production of Sugar (Kakamega)	3,290,000 ksh	411,250 US\$
A Steel Cullery (Nakuru)	2,836,535 ksh	354,567 US\$
A Bicycles and Spare Parts (Nakuru)	1,738,023 ksh	217,253 US\$
A Craft Paper (Eldoret)	1,709,180 ksh	213,648 US\$
B Lead Pencils (Nakuru)	1,048,718 ksh	131,090 US\$
B Surgical Bandages (Nakuru)	1,023,158 ksh	127,895 US\$
B Milk Churns (Nakuru)	986,676 ksh	123,335 US\$
B Bicycle Chains (Nakuru)	863,843 ksh	107,980 US\$
B Confectionery Products (Kisumu)	788,000 ksh	98,500 US\$
B Bifurcated Rivets (Nakuru)	757,470 ksh	94,684 US\$
C Printing Press (Nakuru)	413,976 ksh	51,747 US\$
C Tin Cans (Nakuru)	367,947 ksh	45,994 US\$
C Cardboard Tubes (Nakuru)	315,159 ksh	39,395 US\$
C Leather Works (Kisumu)	200,000 ksh	25,000 US\$
C Corrugated Cartons (Nakuru)	178,460 ksh	22,308 US\$
C Farm Machinery (Kisumu)	170,400 ksh	21,300 US\$
C Plastic Goods (Kisumu)	140,000 ksh	17,500 US\$

Average A: 299,180 US\$

B: 113,900 US\$

C: 31,892 US\$

Table 7-5 Loans (Machinery Purchase Funds) by K.I.E. to Enterprises in Nakuru Industrial Estate

	A. No. of enterprises	B. Amount disbursed	A/B
1973/4	9	1,783,407 ksh	198,156 ksh
1974/5	9	3,317,162 ksh	368,574 ksh
1975/6	11	2,470,035 ksh	224,549 ksh
TOTAL*	18	7,570,604 ksh	420,589 ksh (420,589 ksh = 52,574 US\$)

* The total number of enterprises is lower than the cumulative total for each year because the same enterprise may in some cases have received a loan for two or three years.

Table 7-6 Loans to Enterprises in Standard Workshops

B-Type	C-Type	Amount of Loan	
0	20	640	('000 \$)
1	18	690	
2	16	740	
3	14	790	
4	12	840	
5	10	890	
6	8	940	
7	6	990	
8	4	1,040	
9	2	1,090	
10	0	1,140	

Table 7-7 Loans to Enterprises in Free Design Area

A-Type	B-Type	Amount of Loan	
0	13	1,480	('000 \$)
1	12	1,690	
2	11	1,850	
3	10	2,040	
4	9	2,230	
5	8	2,410	
6	7	2,600	
7	6	2,780	
8	5	2,970	
9	4	3,160	
10	3	3,340	
11	2	3,530	
12	1	3,710	
13	0	3,900	

Judging from the above records, let us consider the amount of funds needed for enterprises in the Nyeri industrial estate.

Let us assume that the 30 industrial projects hypothesized earlier consist of 17 projects for the construction of standard factories and 13 projects for application of free design. When divided into three standard types, the demand for necessary funds may be estimated as follows.

- A \$300,000/enterprise
- B \$114,000/enterprise
- C \$ 32,000/enterprise

However, the A type is not applicable to standard factories, and projects for the free design area belong to types A or B.

- Standard factories B or C
- Free design area A or B

Ten of the standard factories are to be built, but here, it is assumed that one B-type investment project will occupy one factory and that two C-type projects will occupy one factory, and necessary investment funds estimates have been made on this basis. Moreover, regarding the 13 projects in the free design area, it is assumed that they are distributed between types A and B. Based on such assumptions, the estimated amount of loan funds is as follows.

Standard factories (10 buildings)

Minimum	\$ 640,000
Maximum	\$1,140,000
Average	\$ 890,000
Free design area	
Minimum	\$1,480,000
Maximum	\$3,900,000
Average	\$2,690,000

In reality, a quick method would be to set the amount of funds that the K.I.E. should have in order to provide financing of machinery purchase funds and operating funds for enterprises in the Nyeri industrial estate. Taking the ten buildings of standard factories proposed in Chapter 5 as a premise, the amount would be \$900,000 to \$1,100,000, and if all of the 30 projects proposed in Chapter 4 are considered recipients of the financing, including those in the free design area, the amount of funds needed would be \$3,600,000-\$5,000,000.

Since the practicability of the free design area has not yet been ascertained at the present survey stage, in carrying out economic evaluation of the industrial estate in the next chapter, the amount of financing provided to enterprises therein is assumed to be \$1,000,000.

(D) Maintenance and Control

The expenses for maintenance and control come to \$96,000 per year, taking into consideration estimates on personnel expenses for the staff considered appropriate for the proposed K.I.E., with the control staff centered around the estate manager, as well as other expenses.

(E) Assignment of Advisors

The necessary advisors consist of one technical advisor per year for eight years and one managerial advisor per year for eight years. The expenses of assigning the total of 16 man-years of foreign advisors would thus be

$$\text{US\$45,000/person/year} \times 16 \text{ years} = \text{US\$720,000}$$

ii) Expenses for R.M.S.

Since the office of the R.M.S. would be in the administrative building of the Nyeri industrial estate, no particular construction costs would be required, being included in the construction of the industrial estate. Furthermore, as mentioned above, it is thought that the R.M.S. maintenance and control expenses would be included in the expenses of the K.I.E. headquarters.

	Name	No.	Basic Salary	Housing Allowance	Total
1.	Estate Manager	1	2,205	720	2,925
2.	Economist	1	1,512	570	2,082
3.	Engineers	2	3,024	1,140	4,164
4.	Steno/Typist	1	876	480	1,356
5.	Accountant	1	1,512	570	2,082
6.	Clerical Officer	1	327	240	567
7.	Telephone Receptionist	1	327	240	567
8.	Stores Clerk	1	327	240	567
9.	Messengers	2	462	480	942
10.	Station hands	2	462	480	942
11.	Driver	1	417	240	657
12.	Watchmen	2	462	480	942
13.	Foreman	1	1,512	570	2,082
14.	General Mechanics	2	1,098	540	1,638
15.	Electrician	1	549	270	819
16.	Machine Operator, Turner Fitter	2	582	480	1,062
17.	Unskilled Workers	2	582	480	1,062
TOTAL		24	16,236	8,220	24,456
	Motor Vehicles	2			7,000
	Office Equipment				1,500
	Other Running Costs				4,000
	Advisors' Housing Allowance				1,500
TOTAL EXPENDITURE					38,456

The advisors are needed at once, and it is expected that they would be assigned for the ten year period through the Nyeri set-up period until 1986.

iii) *Expenses for Karatina I.P.A.*

When the construction-related expenses are roughly calculated based on the proposed basic plan for the Karatina I.P.A., they are as given in the following table.

It should be noted that no other expenses are needed for the I.P.A.

iv) *Expenses for the various R.I.D.C.s*

(A) Construction

The following table gives a rough calculation of the construction expenses based on the proposed draft plan for each R.I.D.C.

(B) Machinery and Facilities Expenses

This represents the machinery to be installed in the R.I.D.C. workshops. It is important that the machinery offered fits the type of demand in the specific district, and careful and appropriate selection must be made for this purpose.

Thus, it is difficult to assume the contents of the selection, but judging from the records of other R.I.D.C. use and purchases, the amount of US\$40,000 per R.I.D.C. can be thought appropriate. However, in the case of the Nyeri R.I.D.C., it is thought that half of the machinery for the initial goals has already been installed.

(C) Financing Expenses
Refer to Chapter 6.

(D) Maintenance and Control Expenses
In light of the personnel expenses for the R.I.D.C. staff, based on the K.I.E. proposal and centered around the R.I.D.C. manager, and other expenses as estimated, the maintenance and control expenses are roughly calculated as US\$84,000 per year.

(E) Assignment of Advisors
The construction preparation period and the construction period for the R.I.D.C. are taken to be a total of two years. It is also thought that two years after the completion of construction will be needed for the R.I.D.C. functions to settle into good operating order. Thus, advisors should be assigned for the period of four years. In the case of the existing Nyeri R.I.D.C., however, this period would be two years.

Thus, the total number of advisors required by the four R.I.D.C.s is 14.

Name	No.	Basic Salary	Housing Allowance	Total
1. Centre Manager	1	2,205	720	2,925
2. Short-hand Typist	1	726	360	1,086
3. Book-keeper	1	876	480	1,356
4. Clerical Officer	1	327	240	567
5. Stores Clerk	1	327	240	567
6. Drivers	2	834	480	1,314
7. Telephone Receptionist	1	327	240	567
8. Leather Technician	1	549	270	819
9. Mechanical Engineer	1	1,512	570	2,082
10. General Mechanic	1	549	270	819
11. Field Office-Wood Work	1	549	270	819
12. Wood Work Technician	1	549	270	819
13. Sheet Metal Technician	1	549	270	819
14. Field Officer-Metal Work	1	549	270	819
15. Unskilled Worker	1	291	240	531
16. Spray Painter	1	549	270	819
17. Pottery Technician	1	549	270	819
18. Station Hand	1	231	240	471
19. Messenger	1	231	240	471
20. Watchmen	2	462	480	942
Total	22	12,741	6,690	19,431
Motor Vehicles				7,000
Office Equipment				1,500
Other running costs				4,000
House allowance for adviser				1,500
Total expenditure				<u>£33,431</u>

Table 7-8 Cost Breakdown for Karatina I.P.A.

Work	Type of Work	Area, Length, etc.	Unit cost	Amount	Remarks	
1. Civil engineering	a. Land grading	3,500 M ²	US\$ 1.1	US\$ 3,850		
	b. Road work	360 M ²	18.5	6,660		
	c. Paving	894 M ²	7.4	6,616		
	d. Planting	320 M ²	1.3	416		
	Sub-total			US\$17,542 Δ 18,000		
2. Construction	a. Shed	600 M ²	US\$74.1	US\$44,460		
	Sub-total			US\$44,000		
3. Construction & facilities	a. Shed	600 M ²	US\$18.5	US\$11,100	Interior wiring Lighting, Elec. sockets, Water supply, dis- charge, & hygiene facilities Fire extinguishers	
	Sub-total			US\$11,000		
4. Other works	a. Fences, gates	—				
	b. Water drainage (ϕ6" steel pipe) Installation	110 M	US\$ 6.7	US\$ 737		
	c. Water supply pipe (ϕ32) Installation	110 M	17.5	1,925		
	d. Communications facilities (switchboard) Installation	110 M	1.9	209		
	e. Simple water treatment facilities Incinerator Water collection tank Soakage pits	110 M	5.6	616		
	f. Water pump Installation	1 set		222	Switchboard, telephones, wiring	
	Sub-total	1 set		2,593		
					1,852	
					US\$ 8,154 Δ 8,000	
		Total			US\$81,000	
5. Design & administrative expenses	Expenses x 15%			US\$12,000		
	Grand Total			US\$93,000		

Table 7-9 Construction Cost Breakdown for Nyakururu R.I.D.C.

Work	Type of Work	Area, Length, etc.	Unit cost	Amount	Remarks
1. Civil engineering	a. Land grading	5,400 M ²	US\$ 1.1	US\$ 5,940	
	b. Road work	504 M ²	18.5	9,324	
	c. Paving	1,410 M ²	7.4	10,434	
	d. Planting	1,139 M ²	1.3	1,481	
	Sub-total			US\$ 27,179 Δ 27,000	
2. Construction	a. Administration	250 M ²	US\$222.0	US\$ 55,500	
	b. Shed	360 M ²	74.1	26,676	
	Sub-total			US\$ 82,176 Δ 82,000	
3. Construction & facilities	a. Administration	250 M ²	US\$ 55.6	US\$ 13,900	Interior wiring Lighting Elec. sockets Water supply, drainage, & hygiene facilities Fire extinguishers
	b. Shed	360 M ²	18.5	6,660	
	Sub-total			US\$ 20,560 Δ 21,000	
4. Other works	a. Fences, gates				
	b. Water drainage (φ6" steel pipe) Installation	134 M	US\$ 6.7	US\$ 898	
	c. Water supply pipe (φ32) Installation	134 M	17.5	2,345	
	d. Communications facilities (switchboard) Installation	134 M	1.9	255	
	e. Simple water treatment facilities Incinerator	134 M	5.6	750	
	Water collection tank	1 set		5,556	
	Soakage pits	1 set		1,852	
	f. Water pump Installation	1 set		1,852	
	Sub-total			US\$ 13,508 Δ 14,000	
	Total			US\$144,000	
5. Design & administrative expenses	Expenses x 15%			US\$ 22,000	
Grand Total				US\$166,000	

Table 7-10 Construction Cost Breakdown for Muranga R.I.D.C.

Work	Type of Work	Area, Length, etc.	Unit cost	Amount	Remarks	
1. Civil engineering	a. Land grading	5,265 M ²	US\$ 1.1	US\$ 5,792		
	b. Road work	642 M ²	18.5	11,877		
	c. Paving	1,189 M ²	7.4	8,799		
	d. Planting	941 M ²	1.3	1,223		
	Sub-total			US\$ 27,691 Δ 28,000		
2. Construction	a. Administration	250 M ²	US\$222.0	US\$ 55,500		
	b. Shed	360 M ²	74.1	26,676		
	Sub-total			US\$ 82,176 Δ 82,000		
3. Construction & facilities	a. Administration	250 M ²	US\$ 55.6	US\$ 13,900	Interior wiring Lighting Elec. sockets Water supply, discharge, & hygiene facilities Fire extinguishers	
	b. Shed	360 M ²	18.5	6,660		
	Sub-total			US\$ 20,560 Δ 21,000		
4. Other works	a. Fences, gates	—				
	b. Water drainage pipes (φ6" steel pipe) Installation	137 M	US\$ 6.7	US\$ 918		
	c. Water supply pipe (φ32) Installation	137 M	17.5	2,398		
		137 M	1.9	260		
	d. Communications facilities (Switchboard) Installation	137 M	5.6	767		
		1 set		5,556		
	e. Simple water treatment facilities Incinerator	1 set		1,852		
	Water collection tank					
	Soakage pits					
	f. Water pump Installation	—				
5. Design & administrative expenses	Sub-total			US\$ 13,603 Δ 14,000		
	Total			US\$145,000		
	Expenses x 15%			US\$ 22,000		
	Grand Total			US\$167,000		

Table 7-11 Construction Cost Breakdown for Nanyuki R.I.D.C.

Work	Type of Work	Area, Length etc.	Unit cost	Amount	Remarks
1. Civil engineering	a. Land grading	7,700 M ²	US\$ 1.1	US\$ 8,470	
	b. Roads	720 M ²	18.5	13,320	
	c. Paving	1,294 M ²	7.4	9,576	
	d. Planting	711 M ²	1.3	924	
	Sub-total			US\$ 32,290 Δ 32,000	
2. Construction	a. Administration	250 M ²	US\$222.0	US\$ 55,500	
	b. Shed	360 M ²	74.1	26,676	
	Sub-total			US\$ 82,176 Δ 82,000	
3. Construction facilities	a. Administration	250 M ²	US\$ 55.6	US\$ 13,900	Interior wiring Lighting Elec. sockets Water supply, discharge, & hygiene Fire extinguishers
	b. Shed	360 M ²	18.5	6,600	
	Sub-total			US\$ 20,560 Δ 21,000	
4. Other works	a. Fences, gates	—			
	b. Water drainage pipe (ø6" steel pipe) Installation	120 M	US\$ 6.7	US\$ 804	
	c. Water supply pipe (ø32) Installation	120 M	17.5	2,100	
	d. Communications facilities (switchboard) Installation	120 M	1.9	228	
	e. Simple water treatment facilities Incinerator Water collection tank Soakage pits	120 M	5.6	672	
	f. Water pump Installation	1 set		5,556	
		1 set		1,852	
		1 set		1,852	
	Sub-total			US\$ 13,064 Δ 13,000	
	Total			US\$148,000	
5. Design & administrative expenses	Expenses x 15%			US\$ 22,000	
	Grand Total			US\$170,000	

Chapter 8

Economic Evaluation of Industrial Estate Development

The economic evaluation of the industrial estate can be made from two aspects. One is the effect of the industrial estate on the external economy, i.e. an evaluation based on the standpoint of the national or regional economy. The other evaluation is from the standpoint of the profitability and cost-and-profit analysis of the industrial estate.

8-1 Evaluation from the Standpoint of the National and Regional Economies

In consideration of overall government industrialization policies, it is expected that this project will have many good effects on the national economy including correction of the unfavorable balance of payments, increased employment, improved incomes and technical advances. A quantitative evaluation of the development of an industrial estate for the small-scale industries which were the subject of this survey has little significance from the standpoint of the national economy. If an evaluation is made, it is synonymous with describing the suitability and rationality of government policy.

(1) *Economic modernization and creation of investment opportunities for Africans with Kenyan nationality*

Most of the modern industrial fields are controlled by Asians who do not have Kenyan nationality and the fostering and promotion of small scale industries will gradually shift industrial control into the hands of Kenyan citizens and aid in assuring their economic independence and self-sufficiency.

(2) *Correction of the imbalance between urban and rural areas*

The modern monetary economy is centered in the large cities and in the agricultural areas, the self-supporting, self-sufficing non-monetary economy remains to a great extent. This has created an imbalance in economic growth power and income opportunities. Industrial estates and R.I.D.C. activities in rural areas are expected to (1) promote economic modernization in agricultural areas, (2) expand employment opportunities, (3) promotion of agricultural modernization and rationalization, (4) a correction of the imbalance between rural and urban areas and (5) a check on excessive urbanization of the population and the large unemployed and semi-unemployed population of the urban areas.

(3) *Added values increases by the effective utilization of regional resources*

The establishment of industrial projects which will effectively utilize the resources as industrial raw materials in rural regions where raw materials are shipped outside the region or exported to foreign countries will increase the added value of the resources or primary products with respect to both the national and regional economies. This will have major effects on the national economy especially in cases where exported industrial products will be realized on the basis of the rural resources.

(4) *Protection of consumer benefits and economic welfare*

In the case of regional economy, the range is smaller than in urban areas and the establishment of markets for industrial products and supply to such markets is mainly by imports from foreign countries or shipping in from other regions, especially urban areas on the one hand and dependent on supply by local manual industries in the case

of fractionated local markets on the other hand. In the case of such market formation, conditions often arise where consumers are burdened with exorbitant prices and they must purchase inferior products with no chance of selection. The fostering of small-scale industries and rationalization of local handicraft industries lead to the protection of consumer benefits and the promotion of economic welfare in such regional markets.

The provision of an industrial basis including industrial estates is necessary for the establishment of conditions for the realization of industrial projects which will have the above results. However, the 30 types of industrial projects which are considered possible to realize by construction of the industrial estate as part of the establishment of an industrial base have already been decided on the basis of a qualitative investigation of their effects from the standpoint of the national and regional economies. This evaluation is given in Chapter 4 but it will be repeated here for each factor involved.

A. Regional economic evaluation factors

A-1 Industrial projects with a comparatively high employment capacity

Meat processing, starch, carpets, bamboo processing and wood products, urea resins, pine resin refining, rubber sundries, leather tanning, leather processing products, glass sundries, ironworks, agricultural implements, construction fixtures, electrical parts, plastic processing products, sporting goods, machinery repair shops.

A-2 Industrial projects with high multiplied effects

Domestic animal feed, plant oils and fats, starch, cardboard, tanning agents (Cr), urea resins, pine resin refining, leather processing products, ironworks, irrigation equipment, electrical parts, machinery repair shops.

A-3 Industries which contribute to the promotion of other industries such as forestry, agriculture and construction

Meat processing, domestic animal feed, plant oils and fats, fermentation products, starch, carpets, towels, plywood, bamboo processing and wood products, cardboard, sawdust fuel, leather tanning, glass sundries, kiln products, ironworks, agricultural implements, construction fixtures, irrigation equipment, valve products, plastic processing products, machinery repair shops.

B. National economic evaluation factors

B-1 Industries with a high added value

Domestic animal feed, plant oils and fats, fermentation products, carpets, plywood, bamboo processing and wood products, cardboard, tanning agents (Cr), pine resin refining, sawdust fuel, rubber sundries, leather tanning, leather processing products, glass sundries, kiln products, agricultural implements, sporting goods, machinery repair shops.

B-2 Industries with high foreign currency accumulation effects (export oriented type)

Starch, carpets, plywood, pine resin refining, leather tanning, sporting goods.

B-3 Industries with high foreign currency conservation effects (import replacement type)

Fermentation products; towels, bamboo processing and wood products, cardboard, tanning agents (Cr), urea resins, pine resin refining, rubber sundries, leather processing products, glass sundries, kiln products, ironworks, agricultural implements, construction fixtures, irrigation equipment, valve products, electrical parts, plastic processing products.

Next, the concepts concerning repayment of investment and operating costs with respect to the earning from the work shop rental fees will be established for the R.I.D.C. but, as has already been described, the industries for the R.I.D.C. are all small companies with little capital above that needed for entering the industrial estate and since the role of the R.I.D.C. is to foster such companies, the evaluation of feasibility will have to be made from the standpoint of social development. This will have to be achieved by longer-term, lower-interest financing than the industrial estate. Actually, technical and economic cooperation grants have been made to the Kisii R.I.D.C. by S.I.D.A., to the Kakamega and Nyeri R.I.D.C. and the Machakos I.P.A. by the DANIDA and to the Embu R.I.D.C. by N.O.R.A.D. S.I.D.A. is also aiding the Kisumu industrial estate with a grant for cooperative facilities and T.S.C. project expenses (covering 30% of the site construction expenses). Therefore, in the Nyeri set-up, it is desirable that the basic equipment for the R.I.D.C. (including the I.P.A.) apply a gratis cooperation system.

However, concerning the company machinery and equipment investment and operating cost financing among R.I.D.C. activities, the objects of the financing are petty or small scale companies and it is necessary to procure as much long-term, low interest funding as possible. However, if only advisory services to arouse funding demands are attempted, it will be possible to develop financing activities with the possibility of repayment. In this case, the source of long-term low interest capital is not so abundant in this country where the capital supply system such as G.I.S. or G.S.I.S. is not improved yet. Therefore, the source of capital will have to depend on foreign aid.

8-2 Economic Feasibility of Industrial Estate Development Work

The economic feasibility of this work has been evaluated by the N.C.F. method in which the work profit is based on the hypothesis of a single enterprise underaking the industrial estate construction, maintenance and management. This evaluation method is characterized by the fact that it determines if work management with sound financial aspects is possible in accordance with the annual cash flow. Since the actual management system can not be established, a sensitivity analysis is attempted on the basis of hypothetical conditions and the ways of achieving sound work management are investigated.

(1) Prerequisite conditions

- The project life of the industrial estate will be 50 years.
- The elements forming the cash flow will be as follows:

A. Outflow

- a. Construction costs of industrial estate: 2 cases, i.e. US\$1,550,000 and US\$1,317,500
- b. Financing of companies locating in the estate (machinery purchase): 2 cases, i.e. US\$1,000,000 and US\$1,500,000

- c. Administration costs: 3 cases, i.e. US\$96,000/year, US\$48,000/year, and US\$0/year
- d. Repayment of principal and interest of long-term loan

- A-a The construction costs in a. will be all paid in the first year of site operation.
- A-b The financing of locating companies in b. will be disbursed in accordance with the tempo of companies entering the estate. The locating of companies in the estate will be completed within 5 years. Three cases of this tempo are projected as shown in Table 8-1.

Table 8-1 Tempo of Companies Locating on the Site

	1st year	2nd year	3rd year	4th year	5th year
Case I	10%	25%	45%	70%	100%
Case II	20%	40%	60%	80%	100%
Case III	30%	55%	75%	90%	100%

- A-c The management expenses will be the total expenses calculated from the first year of operation. There are three cases: US\$96,000, US\$48,000 or no expenses annually.
- B. In-flow
 - a. Leasing fees for standard sheds: According to the K.I.E. leasing fee calculation method, these will total US\$169,800 (US\$32.6/m²) when the occupancy rate is 100%. Housing leasing fees are at US\$25/m²/year.
 - b. Machinery leasing fees from locating companies (According to the amount of equipment purchased).
 - c. Income from long-term loans (according to credit demand).
- B-a Shed leasing fees will be proportional to the occupancy rate.
- B-b Machinery purchasing costs will be paid in full by the K.I.E. when the company locates in the estate and the company will lease the machinery. The leasing conditions will be an interest year of 8% annually with a repayment period of eight years for the principal and interest (one year deferment).
- B-c In the case of the long-term loans, the loans will be made when the site construction and machinery purchase costs are both paid.
- C. Loan conditions
 - C-a There will be 4 cases for interest: 2.5%, 3.5%, 4.0% and 4.5%.
 - C-b There will be two repayment cases: 20 years and 30 years with a five year deferment.

(2) *N.C.F. calculation*

In accordance with all of the above conditions, the annual net cash flow (N.C.F.) was first calculated as shown in Table 8-2. Table 8-3 shows the calculation results for 35 cases. The symbols at the top of Table 8-2 are as follows:

LD:	Loans	RF:	Shed leasing income
RM:	Repayment of machinery and operating expenses by locating companies		
RE:	Total inflow (LD + RF + RM)		
CC:	Construction costs		
EM:	Machinery purchasing costs		
OE:	Management costs		
TA:	Loan repayments		
EX:	Total outflow (CC + EM + OE + TA)		
AB:	Annual balance		
CB:	Cumulative balance		

Table 8-3 shows the results of the N.C.F. calculated on the basis of the above conditions with the break even point starting from the year when the estate construction begins. This shows part of the possible combinations. On the basis of these initial evaluations, a sensitivity analysis will be made when other cases are successively taken up and conditions changed.

(3) *Evaluation of project profitability*

Among the previous calculations, No.1 will be taken first as the standard case. The conditions hypothesized for this case are as follows:

- a) Construction costs: US\$1,550,000
When the shed leasing fees are calculated by the K.I.E. method on the basis of these fees, they have a basic price of US\$32.6/m²/year which amounts to an annual leasing income of US\$1,698,000 when the estate is 100% occupied.
- b) Long-term loan interest: 4% per year
- c) Repayment conditions: 20 years after a five year grace period
- d) Occupancy rate: Case III (30%, 55%, 75%, 90%, 100%)
- e) Management expenses: US\$96,000/year

Table 8-3 shows the format of the N.C.F. under these conditions calculated for a 50-year project life. In this case, the cumulative balance goes into surplus in the 41st year. The deficit continues for 15 years after all of the loans are paid back.

When the fund procurement conditions are lowered by only 0.5%, the pay-back period is decreased by only two years as shown in case No. 2. Even when the interest rate is 2.5% financing for locating company in the estate is raised to US\$1,500,000, the pay-back period is 36 years. When the management costs are half of those for case No. 1, i.e. in case No. 3, the cumulative balance first shows surplus in the 25th year (cumulative balance goes into surplus before loan repayment is completed). If the management costs are procured as special funds and are not involved in the project profit (cases No. 5 and 6), the figures to into surplus in a short time.

Considering the burden on the companies located in the estate, the shed rental fees of US\$32.6/m²/year are higher than those of existing estates (US\$12.6/m²/year for Nakuru, US\$17.1/m²/year for Nairobi and US\$22.5/m²/year for Mombasa). If the machinery purchasing fees are US\$1,500,000, the leasing fee becomes US\$55.4/m²/year and the company has to pay a total annual leasing fee of US\$88/m². This is high when compared with the average expense of US\$61.4/m² in Kusumu and it will affect the profit of the companies entering the estate.

Table 8-2 Table of Cash Flow

LIST NO. KE- 1

YEARS	LD	MF	HM	ME	CC	EM	OE	TA	EX	UNIT : 1000 DOLLARS	
										AB	CB
0	150.0	0.0	0.0	150.0	0.0	0.0	0.0	0.0	150.0	0.0	0.0
1	300.0	30.9	0.0	300.0	0.0	300.0	0.0	62.0	458.0	-107.1	-107.1
2	250.0	93.4	24.0	250.0	0.0	250.0	96.0	86.0	432.0	-64.6	-171.7
3	200.0	177.2	77.6	200.0	0.0	200.0	96.0	108.0	402.0	3.0	-168.7
4	150.0	242.6	144.6	150.0	0.0	150.0	96.0	122.0	368.0	56.3	-112.2
5	100.0	269.8	136.1	100.0	0.0	100.0	96.0	134.0	330.0	95.9	-116.4
6	0.0	269.8	136.1	0.0	0.0	0.0	96.0	219.4	315.4	35.3	18.9
7	0.0	269.8	136.1	0.0	0.0	0.0	96.0	222.4	318.4	43.5	62.4
8	0.0	269.8	136.1	0.0	0.0	0.0	96.0	224.9	320.9	41.0	103.3
9	0.0	269.8	136.1	0.0	0.0	0.0	96.0	226.9	322.9	39.0	142.4
10	0.0	269.8	136.1	0.0	0.0	0.0	96.0	228.4	324.4	-20.1	122.2
11	0.0	269.8	136.1	0.0	0.0	0.0	96.0	229.4	325.4	-69.1	55.1
12	0.0	269.8	136.1	0.0	0.0	0.0	96.0	229.4	325.4	-107.5	-54.4
13	0.0	269.8	136.1	0.0	0.0	0.0	96.0	229.4	325.4	-136.3	-190.7
14	0.0	269.8	136.1	0.0	0.0	0.0	96.0	229.4	325.4	-155.6	-346.3
15	0.0	269.8	136.1	0.0	0.0	0.0	96.0	229.4	325.4	-155.6	-501.9
16	0.0	269.8	136.1	0.0	0.0	0.0	96.0	229.4	325.4	-155.6	-657.4
17	0.0	269.8	136.1	0.0	0.0	0.0	96.0	229.4	325.4	-155.6	-813.0
18	0.0	269.8	136.1	0.0	0.0	0.0	96.0	229.4	325.4	-155.6	-968.5
19	0.0	269.8	136.1	0.0	0.0	0.0	96.0	229.4	325.4	-155.6	-1124.1
20	0.0	269.8	136.1	0.0	0.0	0.0	96.0	229.4	325.4	-155.6	-1279.6
21	0.0	269.8	136.1	0.0	0.0	0.0	96.0	229.4	325.4	-155.6	-1435.2
22	0.0	269.8	136.1	0.0	0.0	0.0	96.0	229.4	325.4	-155.6	-1590.7
23	0.0	269.8	136.1	0.0	0.0	0.0	96.0	229.4	325.4	-155.6	-1746.3
24	0.0	269.8	136.1	0.0	0.0	0.0	96.0	229.4	325.4	-155.6	-1901.8
25	0.0	269.8	136.1	0.0	0.0	0.0	96.0	229.4	325.4	-155.6	-2057.4
26	0.0	269.8	136.1	0.0	0.0	0.0	96.0	229.4	325.4	-155.6	-2212.9
27	0.0	269.8	136.1	0.0	0.0	0.0	96.0	229.4	325.4	-155.6	-2368.5
28	0.0	269.8	136.1	0.0	0.0	0.0	96.0	229.4	325.4	-155.6	-2524.0
29	0.0	269.8	136.1	0.0	0.0	0.0	96.0	229.4	325.4	-155.6	-2679.6
30	0.0	269.8	136.1	0.0	0.0	0.0	96.0	229.4	325.4	-155.6	-2835.1
31	0.0	269.8	136.1	0.0	0.0	0.0	96.0	229.4	325.4	-155.6	-2990.7
32	0.0	269.8	136.1	0.0	0.0	0.0	96.0	229.4	325.4	-155.6	-3146.2
33	0.0	269.8	136.1	0.0	0.0	0.0	96.0	229.4	325.4	-155.6	-3301.8
34	0.0	269.8	136.1	0.0	0.0	0.0	96.0	229.4	325.4	-155.6	-3457.3
35	0.0	269.8	136.1	0.0	0.0	0.0	96.0	229.4	325.4	-155.6	-3612.9
36	0.0	269.8	136.1	0.0	0.0	0.0	96.0	229.4	325.4	-155.6	-3768.4
37	0.0	269.8	136.1	0.0	0.0	0.0	96.0	229.4	325.4	-155.6	-3924.0
38	0.0	269.8	136.1	0.0	0.0	0.0	96.0	229.4	325.4	-155.6	-4079.5
39	0.0	269.8	136.1	0.0	0.0	0.0	96.0	229.4	325.4	-155.6	-4235.1
40	0.0	269.8	136.1	0.0	0.0	0.0	96.0	229.4	325.4	-155.6	-4390.6
41	0.0	269.8	136.1	0.0	0.0	0.0	96.0	229.4	325.4	-155.6	-4546.2
42	0.0	269.8	136.1	0.0	0.0	0.0	96.0	229.4	325.4	-155.6	-4701.7
43	0.0	269.8	136.1	0.0	0.0	0.0	96.0	229.4	325.4	-155.6	-4857.3
44	0.0	269.8	136.1	0.0	0.0	0.0	96.0	229.4	325.4	-155.6	-5012.8
45	0.0	269.8	136.1	0.0	0.0	0.0	96.0	229.4	325.4	-155.6	-5168.4
46	0.0	269.8	136.1	0.0	0.0	0.0	96.0	229.4	325.4	-155.6	-5323.9
47	0.0	269.8	136.1	0.0	0.0	0.0	96.0	229.4	325.4	-155.6	-5479.5
48	0.0	269.8	136.1	0.0	0.0	0.0	96.0	229.4	325.4	-155.6	-5635.0
49	0.0	269.8	136.1	0.0	0.0	0.0	96.0	229.4	325.4	-155.6	-5790.6
50	0.0	269.8	136.1	0.0	0.0	0.0	96.0	229.4	325.4	-155.6	-5946.1

Table 8-3 Results of N.C.F. Calculation (Typical examples)

Case No.	Construction Expenses (\$1,000)	Rental Fees (\$1,000)	Interest (%)	Management Expenses (\$1,000/Years)	Pay-Back Period (Years)
KE- 1	1,550.0	169.8	4.0	96.0	41
2	1,550.0	169.8	3.5	96.0	39
3	1,550.0	169.8	4.0	48.0	25
4	1,550.0	169.8	3.5	48.0	23
5	1,550.0	169.8	4.0	0	2
6	1,550.0	169.8	3.5	0	2
7	1,317.5	169.8	4.0	96.0	36
8	1,317.5	169.8	3.5	96.0	34
9	1,317.5	169.8	4.0	48.0	3
10	1,317.5	169.8	3.5	48.0	3
11	1,317.5	169.8	4.0	0	2
12	1,317.5	169.8	3.5	0	1
13	1,550.0	144.3	4.0	96.0	Δ
14	1,550.0	144.3	3.5	96.0	Δ
15	1,550.0	144.3	4.0	48.0	31
16	1,550.0	144.3	3.5	48.0	29
17	1,550.0	144.3	4.0	0	3
18	1,550.0	144.3	3.5	0	2
19	1,317.5	144.3	4.0	96.0	Δ
20	1,317.5	144.3	3.5	96.0	Δ
21	1,317.5	144.3	4.0	48.0	27
22	1,317.5	144.3	3.5	48.0	26
23	1,317.5	144.3	4.0	0	2
24	1,317.5	144.3	3.5	0	2
KE- 50	1,317.5	208.0	4.0	96.0	24
51	1,317.5	208.0	3.5	96.0	23
52	1,317.5	208.0	4.0	48.0	3
53	1,317.5	208.0	3.5	48.0	3
54	1,317.5	182.0	4.0	96.0	31
55	1,317.5	182.0	3.5	96.0	30
56	1,317.5	182.0	4.0	48.0	3
57	1,317.5	182.0	3.5	48.0	3
58	1,317.5	156.0	4.0	96.0	44
59	1,317.5	156.0	3.5	96.0	41
60	1,317.5	156.0	4.0	48.0	24
61	1,317.5	156.0	3.5	48.0	23

If the leasing fee is lowered to US\$25/m²/year (cases No. 13–18) and the total management expenses are calculated in the project payments, the cumulative deficit can not be overcome within the 50 years of the project life. Even when the management costs are halved, a pay-back period of 29–31 years is required. There is also no change when both the construction costs and leasing fees are lower simultaneously (cases No. 19–24). If the construction costs are cut by 15% and the companies must pay a high leasing fee of US\$40/m²/year, profits can be obtained in 23–24 years even if the total management costs are paid (cases No. 50–53). There are also cases where the leasing fee is US\$35/m²/year as in cases No. 54–57, and US\$30/m²/year as in cases No. 58–61.

As was described previously, increasing the leasing fees makes the profitability of the industrial estate sound but this places a heavy burden on the companies locating in the estate and this goes against the promotion of industrial projects. These make it difficult to evaluate the economic feasibility of the Nyeri industrial estate, which has the aim of fostering small scale industries in an agricultural region.

For reference and separate from Table 8-3, Table 8-4 shows the pay-back periods required for typical examples among 80 cases when a response analysis was performed by changing such factors as shed leasing fees, fund procurement conditions, occupancy rate and management costs with the machinery and operating expenses for a company entering the estate set at US\$1,500,000. The results were the same as in the case of previous analyses. But only in the case of the occupancy rate was there a case of more favorable condition in Table 8-3. However, in Table 8-4, an effect on the project balance could be seen according to the location tempos. As a result, it is evident that the three different location tempos have little actual effect in accordance with the prerequisite that the estate becomes fully occupied in five years.

The I.R.R. obtained for reference for cases No. 21 and No. 60 in Table 8-3 was about 7%.

From the above results, it will be necessary for the shed and machinery leasing fees to be reduced to make the estate profitable and lighten the burden on the companies locating in the estate. The K.I.E. headquarters or the Kenyan government will have to assume most of the burden for the management costs. For example, if the shed leasing income is US\$130,000 at 100% occupancy, the interest rate is 4%, the pay-back conditions are 20 years with a grace period of 5 years, the occupancy tempo is 10%, 25%, 45%, 70% and 100%, and the management costs are US\$48,000/year, the cumulative balance will be in deficit after 40 years and the company burden will be leasing fee of US\$25/m²/year, which is not too much higher than the US\$22.5/m²/year for Mombasa.

Finally when excellent industrial projects are established via R.I.D.C. services in the area of its authority, capital demand is created, and R.I.D.C. financing activities become flourishing, profitability can be questioned, but the supply of basic services for the fostering of a good economic environment, the fundamental aim of this work, must depend on government assistance or grants foreign aid. However, as was pointed out in the previous chapter, the creation of a high level of benefit by the effective utilization of public funds can be considered on the economic, personnel and organizational foundation supported by R.I.D.C. activities in the project accounting system of the Nyeri District as a whole.

Table 8-4 Results of Sensitivity Analysis

Shed leasing FEES (\$1,000)	Interest (%)	Loan pay-back period (years)	Occupancy rate (%)	PAY-BACK PERIOD			
				Management costs			
				96 (\$1,000)	0	80	48
130 (US \$ 25/m ² /year)	2.5	20	Case I 10, 25, 45, 70, 100	79	3		
			Case II 20, 40, 60, 80, 100	77	2		
			Case III 30, 55, 75, 90, 100	75	0		
		30	I	92	3		
			II	90	2		
			III	88	0		
	4.0	20	I	95	25	65	40
			II	93	25		
			III	91	24		
		30	I	118	4	80	40
			II	116	3		
			III	114	3		
4.5	20	I	100	27			
		II	98	26			
		III	97	26			
	30	I	126	31			
		II	124	31			
		III	123	3			
169.8 (KIE calculation method) (US \$ 32.6/m ² /year)	2.5	20	I	38	3		
			II	37	2		
			III	36	0		
		30	I	44	3		
			II	43	2		
			III	42	0		
	4.0	20	I	45	4	37	28
			II	44	3		
			III	43	2		
		30	I	56	4	46	33
			II	55	3		
			III	53	2		
4.5	20	I	48	4			
		II	47	3			
		III	46	2			
	30	I	60	4			
		II	59	3			
		III	58	2			
180.0	4.5	30	I	53			
190.0				48			
200.0				43			
210.0				40			
220.0				37			
225.0				36			
230.0				33			
235.0				31			

Note) Pay-back period indicates the time when the cash balance changes from deficit to surplus.

