


No. 1

MINISTRY OF LABOUR AND SOCIAL WELFARE
THE REPUBLIC OF UGANDA

BASIC DESIGN STUDY REPORT
ON
THE PROJECT FOR IMPROVEMENT
OF
NAKAWA VOCATIONAL TRAINING INSTITUTE
IN
THE REPUBLIC OF UGANDA

JANUARY, 1996

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JAPAN INTERNATIONAL COOPERATION AGENCY
YAMASHITA SEKKEI INC.

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PREFACE

In response to a request from the Government of the Republic of Uganda, the Government of Japan decided to conduct a basic design study on the Project for Rehabilitation and Expansion of Nakawa Vocational Training Institute and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA sent to Uganda a study team from July 29 to August 27, 1995.

The team held discussions with the officials concerned of the Government of Uganda, and conducted a field study at the study area. After the team returned to Japan, further studies were made. Then, a mission was sent to Uganda in order to discuss a draft basic design, and as this result, the present report was finalized.

I hope that this report will contribute to the promotion of the project and to the enhancement of friendly relations between our two countries.

I wish to express my sincere appreciation to the officials concerned of the Government of the Republic of Uganda for their close cooperation extended to the teams.

January, 1996



Kimio Fujita
President

Japan International Cooperation Agency

January, 1996

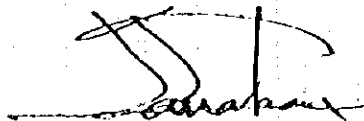
Letter of Transmittal

We are pleased to submit to you the basic design study report on the Project for Improvement of Nakawa Vocational Training Institute in the Republic of Uganda.

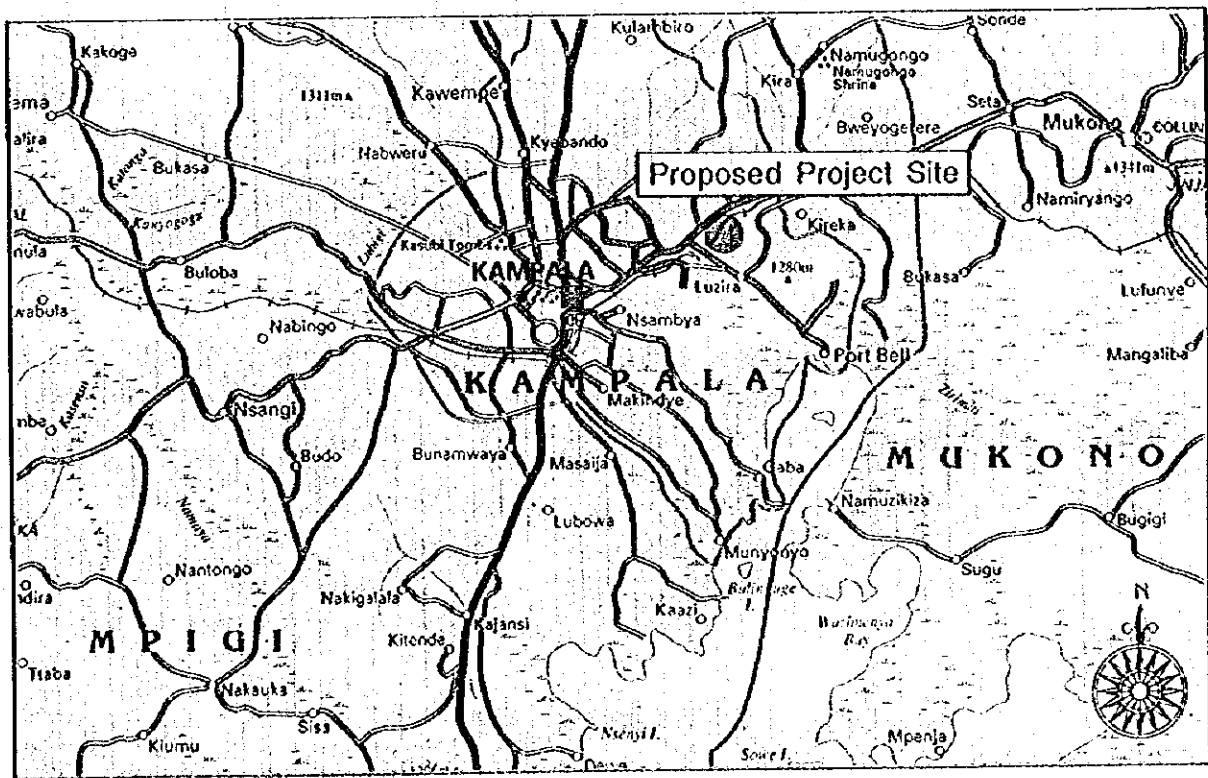
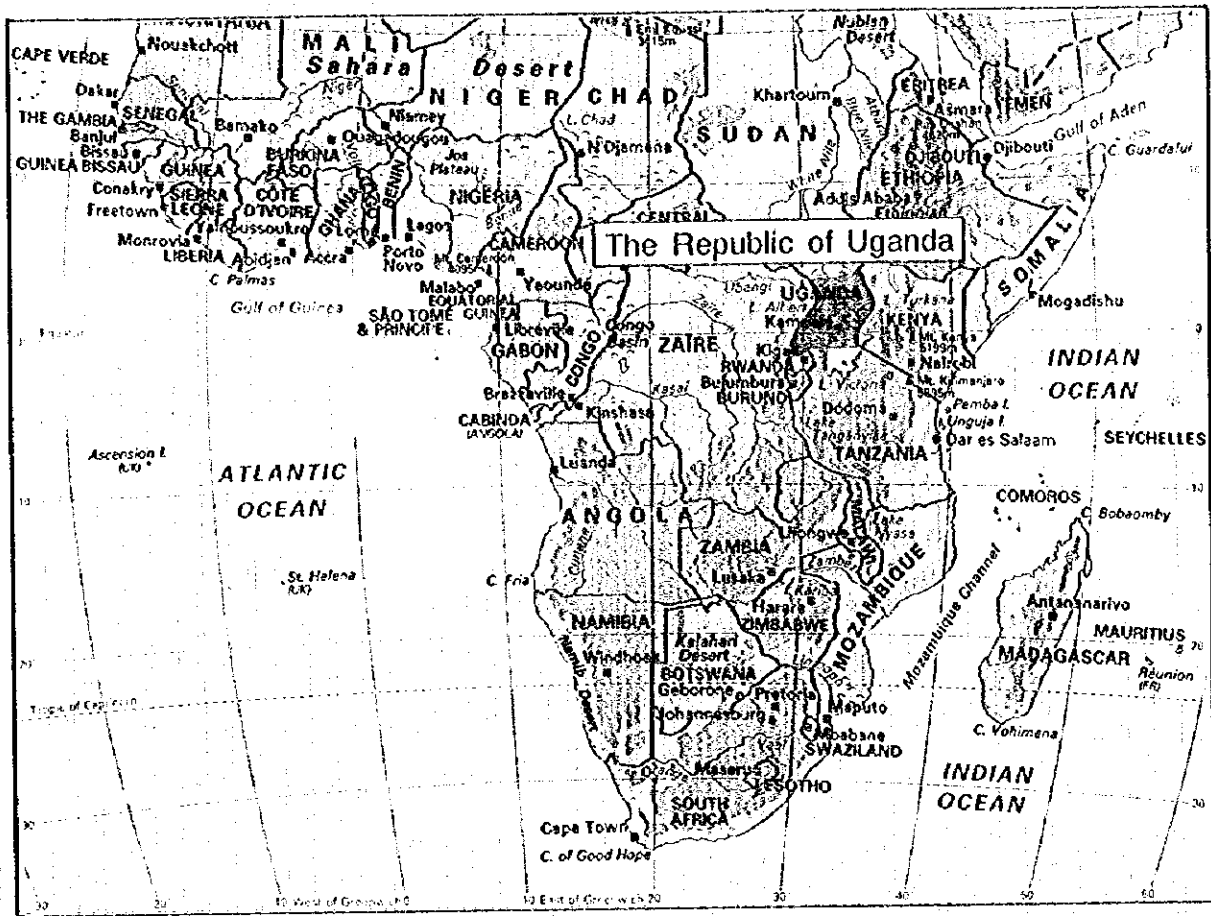
This study was conducted by Yamashita Sekkei Inc., under a contract to JICA, during the period from July 26, 1995 to February 26, 1996. In conducting the study, we have examined the feasibility and rationale of the project with due consideration to the present situation of Uganda and formulated the most appropriate basic design for the project under Japan's grant aid scheme.

Finally, we hope that this report will contribute to further promotion of the project.

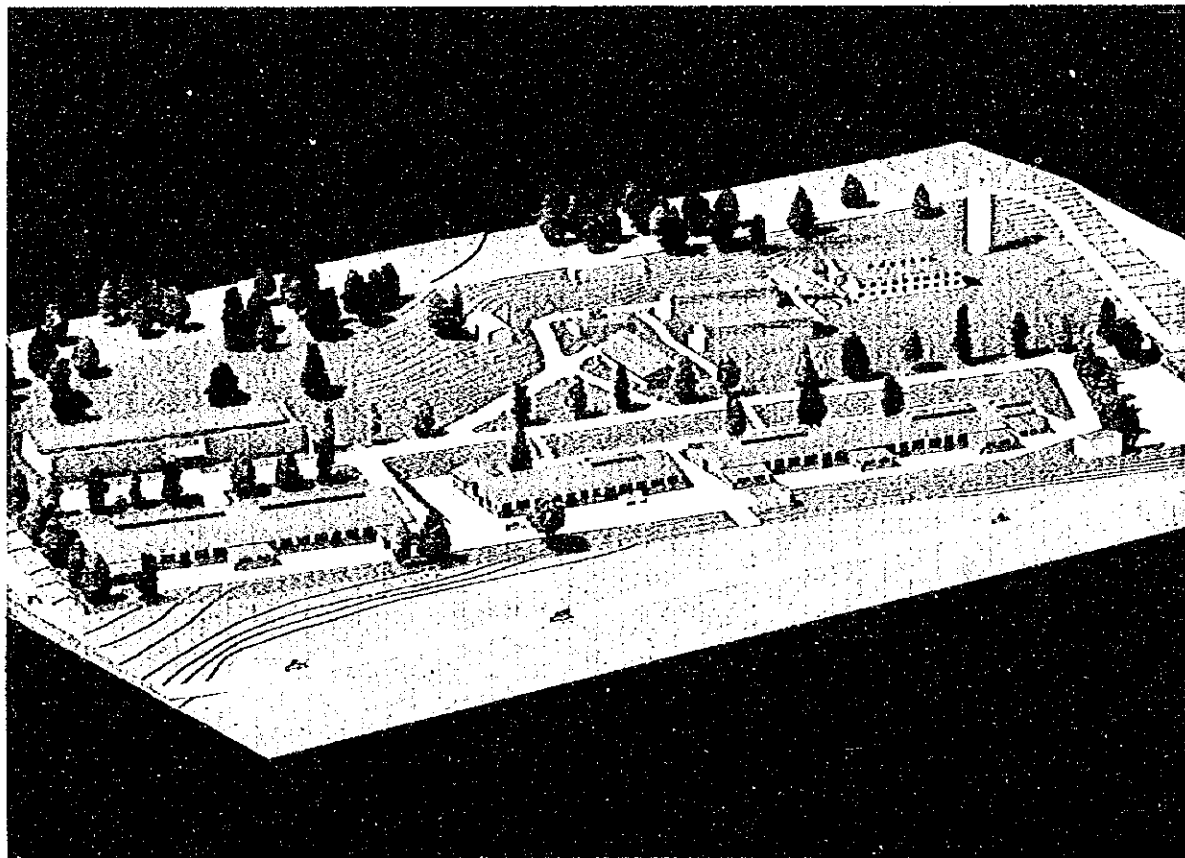
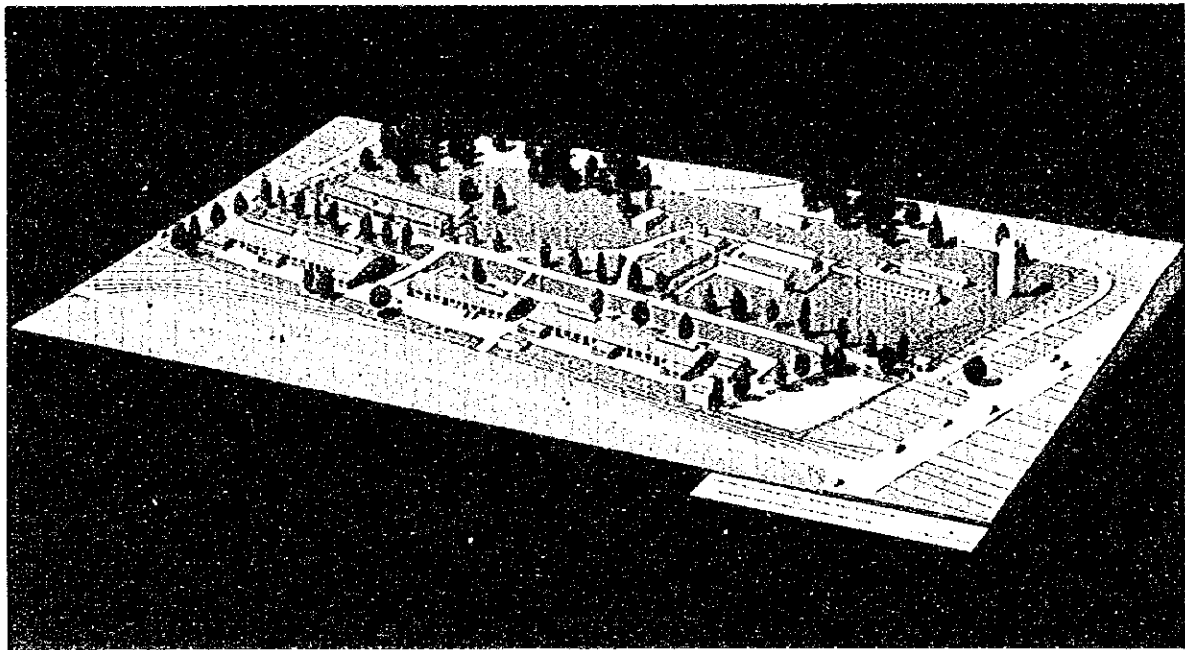
Very truly yours,



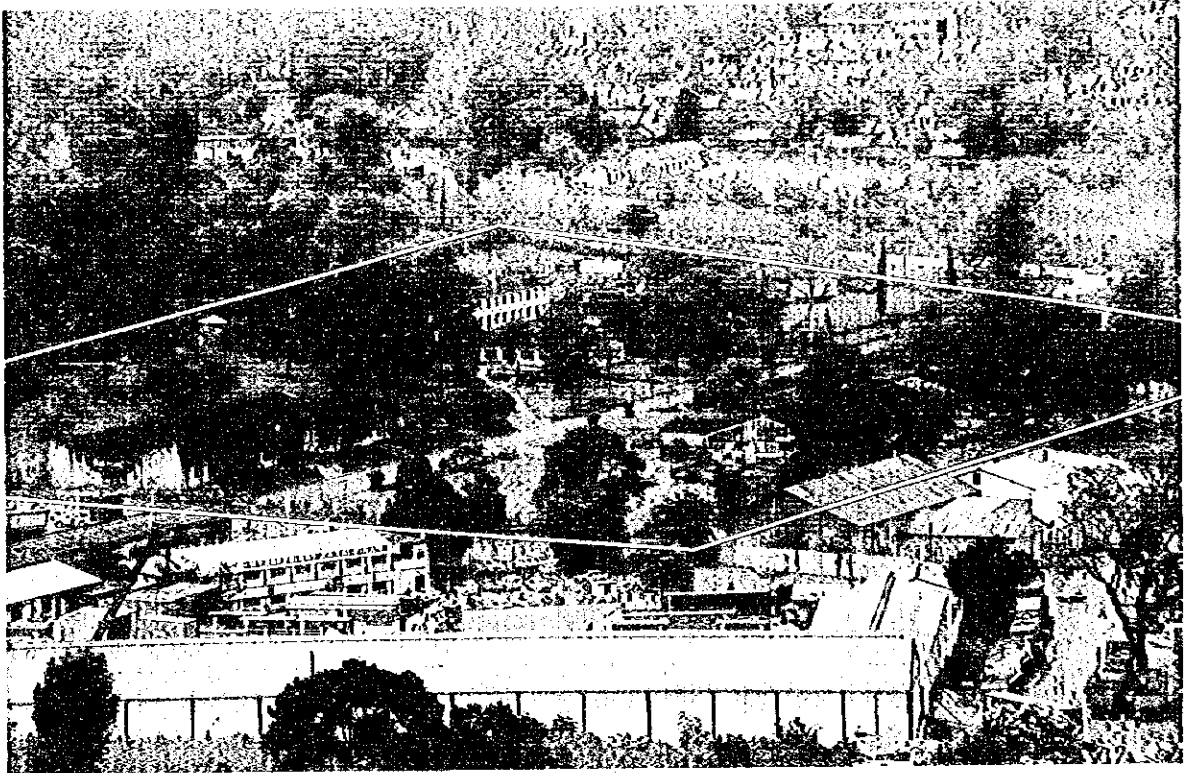
Takanori Tanaka
Project manager,
Basic design study team on
The Project for Improvement of
Nakawa Vocational Training Institute
in the Republic of Uganda
Yamashita Sekkei Inc.



LOCATION MAP



PERSPECTIVE



PROJECT SITE

ABBREVIATIONS

ABBREVIATIONS (in alphabetical order)	NAME IN FULL
ACC	Advanced Craft Certificate
BS	British Standard
DIT	Directorate of Industrial Training
DP	Distribution Panel
FTC	Full Technical Certificate
GTZ	Deutsche Gesellschaft für Technische Zusammenarbeit GmbH (German Technical Cooperation)
IDA	International Development Association
O level	Ordinary level
OTD	Ordinary Technical Diploma
PLE	Primary Leaving Examination
UACE	Uganda Advanced Certificate of Education
UCE	Uganda Certificate of Education
UEB	Uganda Electric Board
UJTC	Uganda Junior Technical Certificate
UNDP	United Nations Development Programme
VAT	Value Added Tax
VTC	Vocational Training Centre
VTI	Vocational Training Institute

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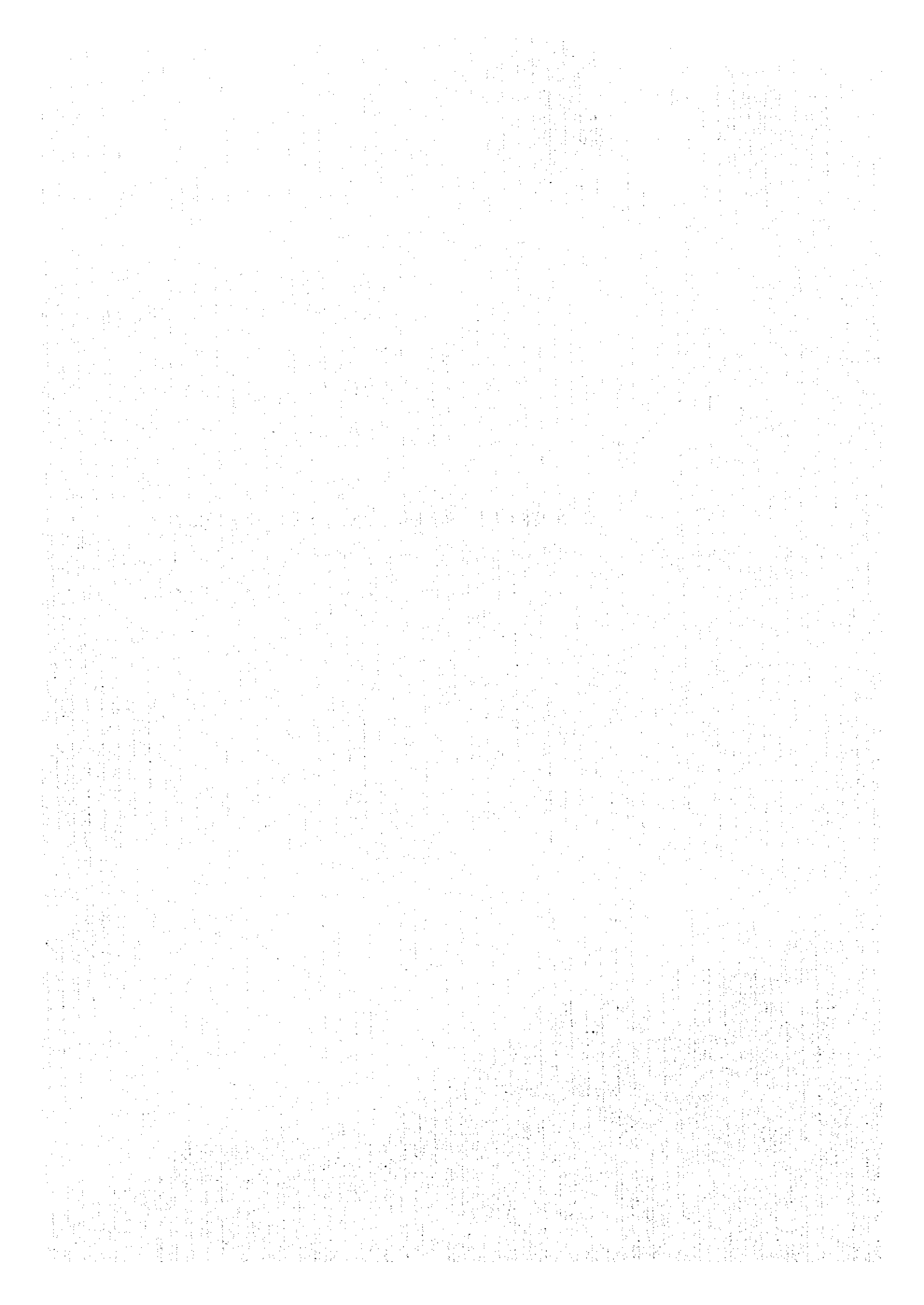
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CHAPTER 1 BACKGROUND OF THE PROJECT



CHAPTER 1 BACKGROUND OF THE PROJECT

1-1 Background of the Project

1-1-1 Industrial Development and Labour Demand

Uganda's manufacturing industry has been growing steadily since 1987. The country's gross domestic product (GDP) increased about 40 times from 7.2 billion Ushs in 1987 to 279.7 billion in 1994. Under the background of such a phenomenal growth of the manufacturing industry, there is a serious shortage of skilled workers in the country's labour market. The Government of Uganda, therefore, emphasizes the need to nurture skilled workers through vocational training in its manpower and employment policy.

(1) Present State of the Country's Industry

① Industrial Development

In Uganda, industry, notably the manufacturing industry, accounts for only 7 percent of the country's gross national product (GNP). The country's economy is still heavily dependent on the agricultural industry, which represents about 50 percent of the country's GNP. As shown in Fig. 1-1, however, the manufacturing industry has been growing steadily since 1987. In fiscal 1993, the manufacturing industry's year-on-year growth rate was about 15 percent, which was far higher than 1.7 percent for the agricultural industry.

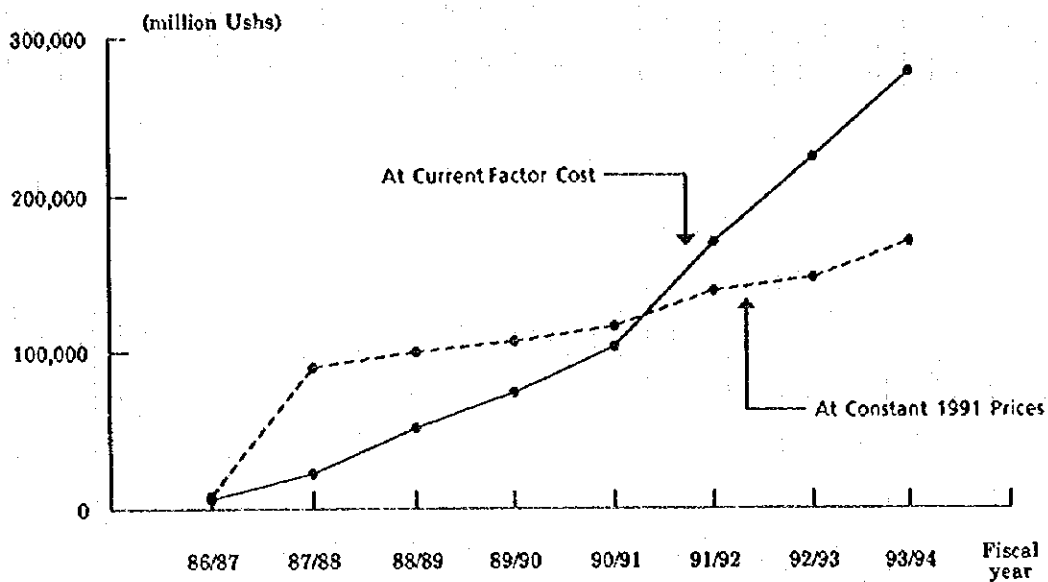


Fig. 1 - 1 Gross Domestic Product in Manufacturing Industrial Sector

On the other hand, the percentage composition of the country's industry shows a dominance of the food-related sector such as coffee, the luxury goods sector such as tobacco and the agriculture-related sectors such as timber processing, as shown in Fig. 1-2.

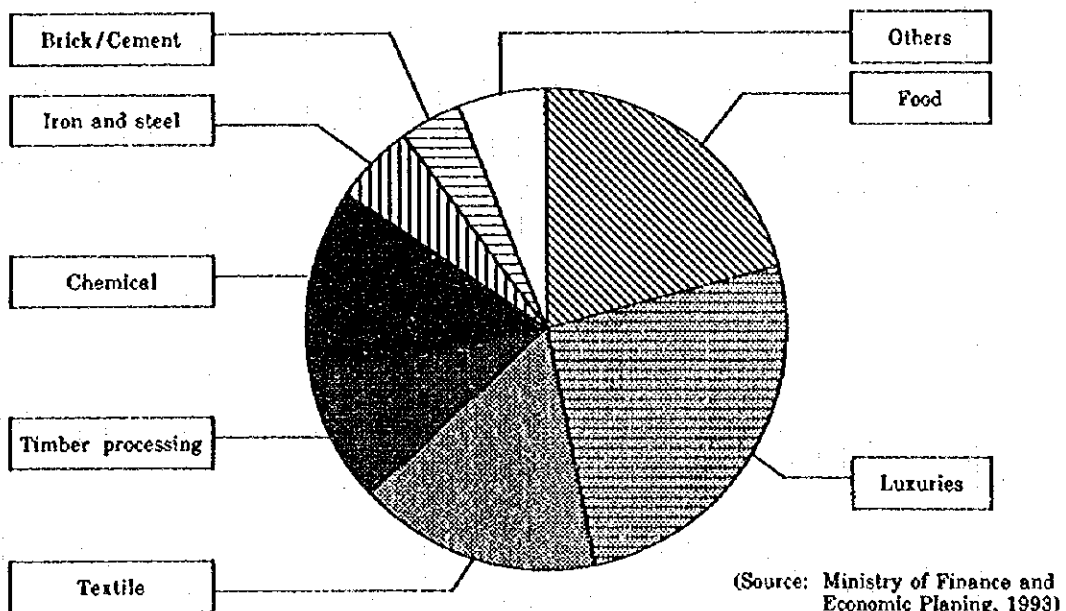


Fig. 1 - 2 Composition of Country's Industry

In recent years, however, chemical, iron and steel, auto parts and plastics sectors have been growing by far faster than the agriculture-related sectors. During the five year period from 1987 to 1991, these sectors' total output increased 4 to 5 times.

As is clear from the above, Uganda's industry is in the process of growing, and it is expected that it will continue to move along a growth path on the strength of the government's industrial promotion policy and financial policy, as well as the improvement in the country's acquisition of foreign currencies.

② Nurturing of medium and small sized industries

One of the outstanding features of Uganda's industry is the low productivity of medium and small sized industrial sectors that command a large majority in it. According to a 1989 survey, the number of manufacturers with more than 500 employees is 12. These manufacturers employ 28 percent of the country's working population and make up 41 percent of the country's industrial production. Those with 500 to 999 employees are highly productive, representing 21 percent of the country's industrial production with only a 9 percent share of the working population. On the other hand, about 70 percent of the country's manufacturers are those with 5 to 9 employees. These manufacturers employ 20 percent of the country's working population but make up only 13 percent of total industrial production. Fig. 1-3 shows the number of workers and output by scale of employment. As is clear from this figure, the country's labour force is concentrated in factories with 20 to 49 employees.

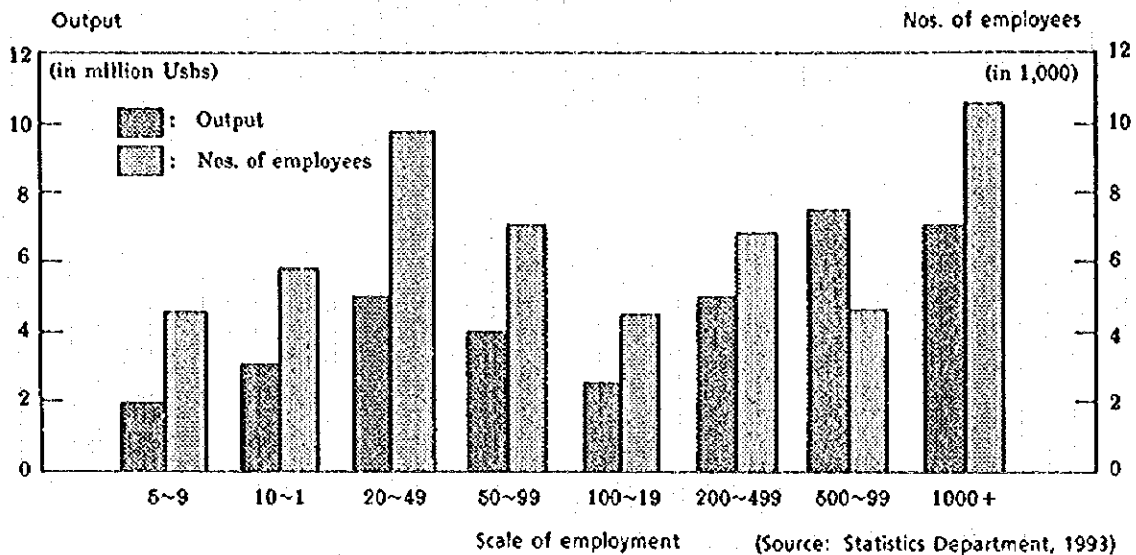


Fig. 1-3 Number of Workers and Output by Scale of Employment

Fig. 1-4 shows a breakdown of types of industry by scale of operation. As is clear from this figure, a considerable number of manufacturers with 20 or less employees are furniture manufacturers and auto repair companies. On the other hand, of manufacturers with more than 500 employees are those of sugar, tobacco and coffee. In other words, growing industrial sectors are considerably supported by medium and small sized manufacturers. It is expected to be essential, therefore, to promote the nurturing of these medium and small sized manufacturers for Uganda's industry to continue to grow.

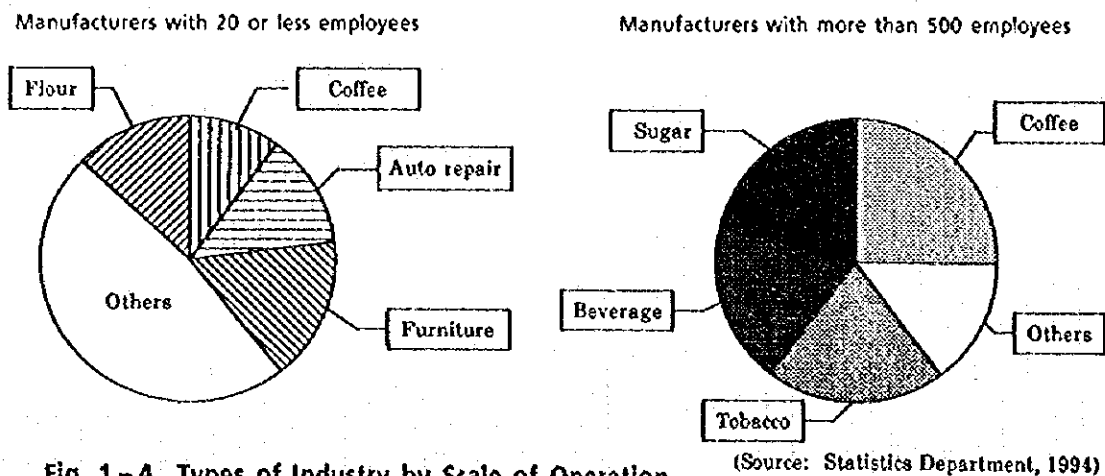


Fig. 1-4 Types of Industry by Scale of Operation

With the background stated above, the Government of Uganda strongly recognizes to increase the productivity of these medium and small sized industries in order to promote the growth of the country's industry and regards the nurturing as the core of its industrial rehabilitation and development plan.

(2) Labour Demand

① Labour force

Uganda's population as of 1991 was about 16.7 million. The average annual rate of increase of population for the period from 1980 to 1990 was 2.52 percent. Of the total population, about 6.3 million constitute the working population. And 75 percent of the working population (namely 4.7 million) are engaged in the agricultural industry. Skilled workers engaged in the manufacturing industry are only 320,000 as seen in Table 1-1. It is estimated that about 250,000 people are entering the country's labour market every year, reflecting a rapid increase in its population. It is impossible, however, for the agricultural industry sector to absorb these newcomers. As the result, many people are moving from rural areas to urban areas.

In light of such a situation, the Government of Uganda emphasizes that the nurturing of medium and small sized industries and job creation is one of its top priorities.

Table 1-1 Working Population by Occupation

(Unit: persons)

Age group \ Occupation	15~24	25~39	40~54	55~65	65 or older	Total (%)
Mangers	603	6,122	3,907	571	144	10,247 (0.1)
Professionals	878	11,711	6,140	667	167	18,563 (0.3)
Technicians	30,721	114,823	41,539	6,666	2,521	196,270 (3.3)
Clerks	8,226	30,323	8,270	836	208	47,863 (0.8)
Service workers	126,883	209,721	64,851	15,023	7,030	423,508 (7.1)
Agricultural workers	1,322,719	1,572,198	871,903	346,435	253,516	4,366,771 (73.6)
Craft workers	75,746	123,857	47,550	15,847	9,421	272,421 (4.6)
Machine operators	7,504	26,157	9,932	2,049	430	46,072 (0.8)
Note stated	199,924	202,171	102,901	30,632	18,873	554,501 (9.4)
Total (%)	1,773,104 (30)	2,296,083 (39)	1,155,993 (19)	418,726 (7)	292,310 (5)	5,936,216 (100)

Note: Surveyed in 1991. Those who did not report their age are excluded.

(Source: Statistics Department, 1994)

② Labour market

At present, the number of people entering the urban labour market is increasing rapidly, and demand for skilled workers is rising in manufacturing industries in particular. A 1989 labour market report says that the number of skilled workers to be newly recruited in urban areas was 17,000 and that manufacturing industries were faced with a shortage of skilled workers. In view of the rapid industrial development and privatization of public enterprises after 1989, it is considered that present demand for skilled workers is far higher than in 1989.

As shown in Fig. 1-5, although the size of the working population in terms of type of job differs from one area to another, the country's labour force is concentrated in coffee and sugar manufacturing, furniture manufacturing, auto repair and textile industries as a whole.

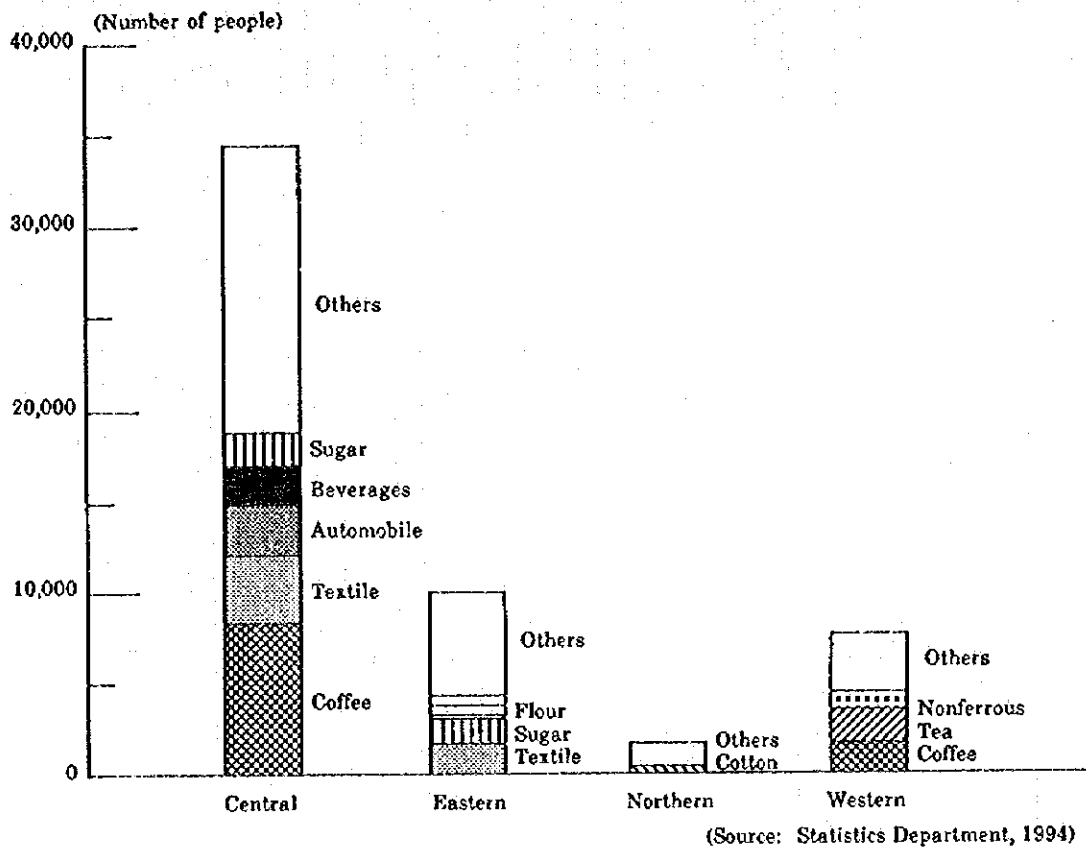


Fig. 1-5 Working Population by District and Job

As to labour demand in terms of type of job, it is thought to be high in the above-mentioned industries. It should be noted that demand is increasing for such types of job as machining, electricity and auto repair which are commonly applicable in those industries.

Uganda's industry has been growing steadily since 1987 on the strength of industrial rehabilitation policy of the government. It is thus estimated that labour demand, particularly demand for skilled workers, will increase in the future. On the other hand, however, there is a fact that 250,000 people are entering the labour market every year. In order to absorb such additional labour force, the government puts a high priority on job creation in urban areas. There is a serious shortage of skilled workers in the manufacturing industries despite an ample supply of labour force.

Labour demand in manufacturing industries is yet to be met fully in this sense. It is expected, on the other hand, the country's industry will grow further supported by the high growth of medium and small sized manufacturers. It can be said, therefore, that there is a strong need to nurture skilled workers who can meet labour demand of these manufacturers.

1-1-2 Actual Situation of Vocational Training

(1) Education System and Vocational Training of Uganda

In Uganda, the Ministry of Education and Sports is in charge of ordinary education, including technical education. The present education system was introduced in the early 1960s. It is an educational system consisting of a 7-year primary school course, a 4-year 0 level secondary school course, a 2-year higher secondary school course and a 2 to 5-year college course. And there is no compulsory educational system. Under the system, there are such qualifying examinations as Primary Leaving Examination (PLE "P-7" level), Uganda Certificate of Education (UCE "0" level), Uganda Advanced Certificate of Education (UACE "A" level) and Uganda Junior Technical Certificate (UJTC). Students who intend to go on to schools of higher grade are required to pass these qualifying examinations in principle. Only those who apply for the basic courses of vocational training institutions which are operating under the Ministry of Labour and Social Welfare are required to obtain "0" level mentioned above. Thus it can be said that the basic courses are regarded as the same rank with the higher secondary institutes or technical schools under the country's education system. The other training courses require no particular qualification to enter but a proper understanding of the English language. Fig.1-6 shows the relationship between ordinary education and vocational training in Uganda.

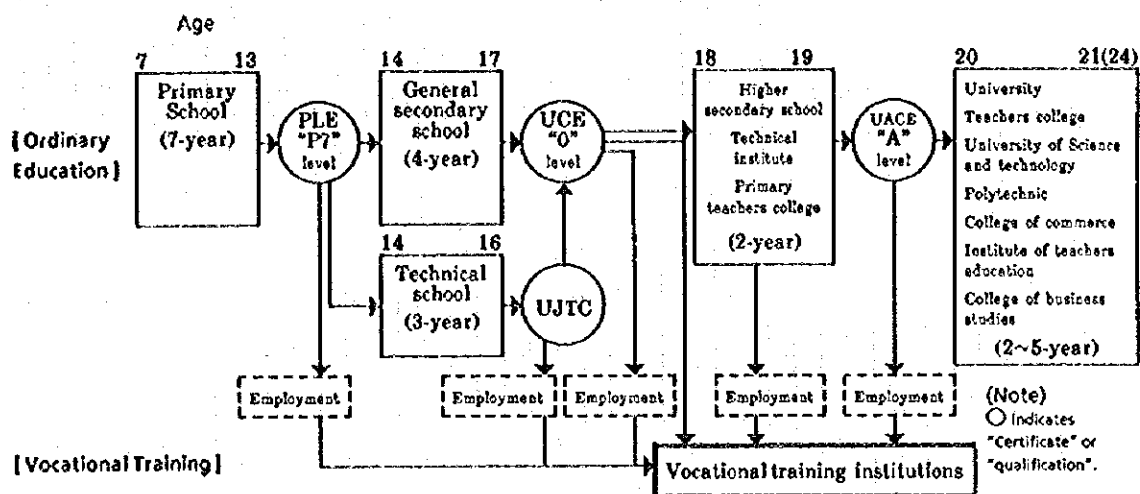


Fig. 1-6 Structure of Education System and Vocational Training

In fiscal 1993, the number of those who obtained "0" level was about 38,500, of which about 26,000 did not go on to institutions of higher education. The number of those who could not get the UACE "A" level and therefore went out into the business world with "0" level qualification is about 10,000. It is estimated, therefore, that about 35,000 to 40,000 people will be the target group for the basic courses offered at vocational training institutions every year.

(2) Vocational Training Institutions

In Uganda, vocational training programmes are carried out under the Ministry of Labour and Social Welfare, and the Directorate of Industrial Training (DIT), which was established in accordance with the Vocational Training Law promulgated in 1972, is in charge of actual vocational training administration. The Vocational Training Law provides for the fields of vocational training and the trade testing standards, based on which the contents and levels of training are decided. Vocational training institutions are divided into public vocational training institutions, which are under the control of the Directorate of Industrial Training and private vocational training institutions which are operating on their own with the public institutions' technical assistance.

1) Public Vocational Training Institutions

A total of five Vocational Training Institutes (VTIs) and Vocational Training Centres (VTCs) are operating under DIT with foreign countries' technical assistance. These institutions are all located in industrial areas such as around Kampala City so that they may meet demand for vocational training in urban areas of the country. At the Jinja VTC, training has been suspended due to the obsolescence of its facilities and equipment, but it is expected that training will be resumed as soon as the condition is improved.

① Training courses

The training courses provided by DIT are as shown in the table 1-2.

Table 1-2 Types of Training Courses

Training course	Trainees' qualification and objective/ contents of training	Training period	VTI/VTC				
			Lugogo VTC	Nakawa VTI	Jinja VTI	Jinja VTC	Masaka VTC
Basic training course	For graduates with 0 level certificate, to nurture skilled craftsmen who form of the core of Uganda's industry. Trainees who have finished this course are given the Craftsman Certificate.	3 years (last one year: on-the-job training)	○		○		
Apprenticeship training course	For unskilled workers working as apprentices. Trainees are to be trained in basic techniques and skills. Trainees who have finished this course are very likely to be qualified to take trade testings.	4 years (6 weeks/year)		○	○		
Upgrading training course	For qualified company employees. Ready-made courses programmed by institutions and modular courses at request of companies are offered. Trainees who have finished this course are given the Certificate of Attendance.	4~6 weeks	○	○	○		
Evening course	This course is offered in the evening. Its contents and level are about the same as those of the upgrading course.	4~6 weeks	△				
"P7" level course	For those who have finished primary school ("7" level). This is a short-term basic training course. Trainees who have finished this course are given the Certificate of Attendance.	80 days					○
Trade testing course	This is a special course for those who intend to take trade testings held by DIT.	4 weeks		○	○		
Instructor course	This is a course to train inexperienced vocational training instructors in instruction methods and theories.	6 weeks			○		

(Note) ○ indicates "offered currently", and △ "being planned".

Basic training courses are currently offered at Jinja VTI and Lugogo VTC to nurture skilled workers who are short in the manufacturing industry. At Jinja VTI, the country's first basic course (2-year course) was opened in fiscal 1990. A total of 125 trainees who had finished this course went out in fiscal 1992. Later, the training period of this course was changed to 3 years. And in fiscal 1994, as many as 127 trainees (in 7 training fields) took this course. Lugogo VTC accepted the first 104 trainees (in 8 training fields) in November 1991, and has since been accepting about the same number of trainees every year.

A basic training course is aimed at nurturing skilled workers to cope with a serious shortage of such workers in Uganda's industry. However, only a little more than 230 trainees are accepted for this course every year, as stated above.

② Training fields

Training fields offered at the public vocational training institutions are as shown in the following table.

Table 1-3 Training Fields in VTI/VTC

Training fields	VTI/VTC				
	Lugogo VTC	Nakawa VTI	Jinja VTI	Jinja VTC	Masulita VTC
1. Welding & Fabrication	○	○	○	(○)	○
2. Plumbing & Pipe Fitting	○	—	○	(○)	—
3. Automotive Engineering	○	○	○	(○)	—
4. Painting & Decorating	○	—	—		—
5. Carpentry & Joinery	○	—	○	(○)	○
6. Fitting & Machining	○	○	○		—
7. Brick/Block Laying	○	—	○		○
8. Electrical Installation	○	○	○	(○)	—
9. Tailoring, etc.					○

(Note) ○ indicates fields offered currently. Training fields before suspension are indicated for Jinja VTC.

Technical fields covered by the present vocational training courses are those commonly needed in construction and other manufacturing industries. There has been a great demand for training in these fields. While it is expected that demand for training in those fields will continue to grow, there is a need to promptly develop new courses to train workers in such technical fields as repair of radios and TVs as well as computer related technology.

2) Private Vocational Training Institutions

As shown in Table 1-4, there are 27 private vocational training institutions, including those which are being planned, in Uganda. While the public vocational training institutions are concentrated in and around Kampala City, these private institutions are mainly scattered in rural areas and are offering small-scale training courses for young people for their self-support.

Table 1-4 Private Vocational Training Institutions

	Name of institution	Location	Promoter	Training fields	Remarks
1	Rynatte College of Design	Kampala	Individual Mrs. Noella N. Kaganda Bakidde	Designing, Tailoring	
2	Mirembe Vocational Training Institute	Kayunga	Mirembe Self Help Project	Designing, Tailoring, Typing etc.	
3	Small Scale Industrial Tech. Technology V.T.C.	Lugazi Town	Individual Mr. M. T. Nkoyoyo	Designing, Tailoring, Typing, Carpentry	
4	Rukore Vocational Training School	Kabale	Rubaya Development Association	(Unknown)	(Proposed)
5	Gulu Rular Community and Vocational Training Centre	Gulu	Jyank and Danish Vocational Service	Brick and concrete, Bicycle, Motor vehicle repair, Carpentry, Joinery, Typewriting, Primary health care, Agriculture	
6	Anaka Vocational Training Centre	Anaka	World Vision	(Unknown)	
7	Collaborative Efforts to Alleviate Social Problems(CEASOP)	Lira	(Unknown)	Carpentry, Joinery, Bicycle repair	Target group: Destitutes, Primary drop outs
8	Ave Maria Vocational Training and Youth Development Centre	Lira	Catholic Church	Carpentry and joinery, Brick and concrete, Motor Vehicle, Welding & fabrication, Knitting, Typing, Computer	

	Name of institution	Location	Promoter	Training fields	Remarks
9	Arivu Christian Vocational Training Centre	Arua	Church of Uganda	(Unknown)	
10	School of Art, Design and Tasm Vocational Training Centre	Lira	Christian Charity Centre	Tailoring, Leather craft, Painting, Decorating, Industrial ceramics, Fine art, Weaving, Agric	
11	Laye Vocational Training	Kampala	Church of Uganda	Carpentry, Joinery, Brick/Concreting	
12	(UGATEDI) Uganda Appropriate Technology and Development Initiative	Magere	Bonnie Kayondo	Ceramics	
13	St. Joseph Kyamulibwa Vocational Training Centre	Masaka	Masaka Diocese Catholic Church	Building and concrete practice, Carpentry and joinery, Electrical, installation, Home economics, Animal husbandry	
14	Companionship of Works Association VTC	Kampala	Mrs. Suparetti Mr. Ronald	Metal fabrication and building trades, Carpentry and joinery	
15	St. Urusula VTC Masaka	Masaka	Bukulula Catholic Parish	Tailoring, Building trades	
16	St. Simon Peter VTC Hoima	Hoima	(Unknown)	(Unknown)	
17	Don Bosco VTC Bombo	Bombo	Fr. Thomas	(Unknown)	
18	Nile Vocational Training Institute Njeru	Jinja	German KNH, African Evangelistic Enterprise	Selding and fabrication, Building trades, Electrical, Tailoring, Banking etc.	
19	Mukono VTC	Mukono	Church of Uganda	(Unknown)	
20	Mbale Municipal Council Proposed VTC for unemployed youth	Mbale	Municipal Council	(Not decided)	(Proposed)
21	Kyotera VTC	Kyotera	Banakaloli Brothers	(Unknown)	
22	Save the Child Project	Kampala	Apt Design and Development Local Communities	(Not decided)	(Proposed)
23	Benedictine Vocational Training and Production Centre	Tororo	Catholic Diocese	(Unknown)	
24	Christian Child Care Project Mbale	Mbale	Mr. Jackson	Secretarial, Tailoring, Appropriate building technology, Joiner, Craft, Manufacture	
25	Pakwachi Vocational Training Centre	Pakwachi	Danish Volunteer Service	Tailoring, Carpentry and joinery, Brick/Block laying, Bicycle repair	
26	Boganda Rd. Primary School	Kampala	PTA/Management Committee	Tailoring, Art & Crafts, Carpentry & joinery, Home economics	
27	United Disabled Group Institute Nakawa	Kampala	Bona Jacob	Tailoring	

Technical training fields offered at those training institutions differ from one vocational training institution to another. But they include training fields which meet demand of local communities such as

tailoring, art and crafts, baking and agriculture. Since trainees who have finished the specific courses are qualified to take trade testings held by the DIT, there are also special trade testing preparation courses. Therefore, DIT is assisting those private institutions by sending instructors, who give technical guidance for trade testing and curriculum development. These private institutions are mostly funded and promoted by individuals, municipalities and religious organizations. As the financial burden of trainees is relatively light, these institutions are contributing to the vocational training for young workers in rural areas. Being small in scale, however, they have not come to meet the labour demand of Uganda's industry.

In Uganda, vocational trainings are offered mainly at the five public vocational training institutions operating under DIT. The fact, however, is that these institutions are not capable of meeting the labour demand of Uganda's industry, which is growing rapidly, particularly in terms of the number of trainees accepted and the quality of facilities and equipment.

1-1-3 Present State of the Nakawa Vocational Training Institute

The present state of Nakawa Vocational Training Institute (Nakawa VTI), where this project is to be implemented, is as described below.

① Training course

Nakawa VTI is offering "Upgrading course" and "Apprenticeship course", each course being offered three times a year. According to its training programme, a total of 380 trainees are accepted each year. Fig.1-7 shows the training programme of Nakawa VTI for fiscal 1995.

Description of training		Training period (planned)											
Training course	Nos. of trainees	Jan.	Feb.	mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Nov.
Upgrading	64	18	21										
Apprenticeship	64			6	19								
Upgrading	64					2	8						
Apprenticeship	64							19	28				
Upgrading	64								7	15			
Apprenticeship	64									25	8		
Trade testing	—											6	3
Total	384												

(Source: Nakawa VTI, Training Programme for 1995)

Fig. 1-7 Training Programme for 1995

② Training fields

Nakawa VTI offers 4 training fields in each of Upgrading and Apprenticeship course.

- Electrical Installation & Fitting
- Welding & Light Metal Fabrication
- Motor Vehicle Repair
- Machining & Fitter General

③ Instructors

At present, Nakawa VTI has a staff of 53, of which 17, including the Principal and the Deputy Principal, are instructors.

- Head of Department : 4
- Instructor : 4
- Assistant Instructor : 7

④ Budget

Annual budget of Nakawa VTI for fiscal 1995/96 is in the amount of 209,550,649 Ushs, of which 112,215,000 Ushs (about 53 percent) is to be covered by its revenue, including tuition fee, and the remainder

comes from the government. Shown below is a breakdown of the institute's total revenue.

1. Tuition Fee	98,160,000 Ushs/year
2. Trade Testing	855,000 Ushs/year
3. Workshop Activities	13,200,000 Ushs/year
<hr/>	
Total Revenue	112,215,000 Ushs/year

⑥ Problems

Training plan of Nakawa VTI is to train 380 trainees in Upgrading Course or Apprenticeship Course every year. As shown in Fig.1-8, however, achievement of the institute is only a total of 230 trainees in 1994. Moreover, training courses held at Nakawa VTI consist of many "Modular Course", which is conducted at the request of companies. As a result, the actual training is different from the planned schedule.

Description of training		Training period (result)											
Training Course	Nos. of Trainees	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Upgrading (4 fields)	21	31	12										
Apprenticeship (4 fields)	20				5	4							
" (Electrical installation)	46				18	13							
Drivers' Preventive Maintenance	8				11	4							
"	7							18	29				
"	11								1	2			
Upgrading (4 fields)	26								22	2			
Drivers' Preventive Maintenance	10			(Unknown)									
U.E.B. Linesmen	6										23	21	
Upgrading (3 fields)	13										24	18	
Trade Testing	26										17	11	
U.E.B. Unesman	8											21	16
Tailor Made	9	17	11										
"	10		15	11									
"	9			14	8								
Total	230												

(Source: Nakawa VII, Annual Report 1994)

Fig. 1-8 Training Courses Provided at Nakawa VII in 1994

The results of an analysis of the above facts show that these problems are attributable mainly to a shortage of facilities and equipment.

Existing facilities of the institute, which were constructed 25 years ago, are already superannuated. Many items of the equipment have become impossible to operate because of breakdown or lack of spare parts. They can no longer be in a position to be used for training purpose. On the other hand, Lugogo VTC, in which facilities and equipment have been arranged with the assistance of GTZ, an excessive number of applications for its basic training courses, the number of applicants being four times that of incoming trainees as seen in table 1-5.

Table 1 - 5 Number of Applicants for Basic Training Courses at Lugogo VTC in 1994

Training fields	a. Nos. of applicants	b. Nos. of incoming trainees	a/b
1. Electrical Installation	69	17	4.06
2. Carpentry & Joinery	49	12	4.08
3. Automotive Engineering	84	16	5.25
4. Brick/block Laying	45	16	2.81
5. Fitting & Machining	61	16	3.81
6. Plumbing & Pipe Fitting	42	14	3.00
7. Painting & Decorating	48	12	4.00
8. Welding & Fabrication	68	12	5.67
Total	466	115	4.05 (average)

As can be seen from the above example, Nakawa VTI is not in a position to meet the ever increasing social demand for vocational training due to a shortage of necessary facilities and equipment.

1-2 Contents of the Request

The contents of the request for the grant aid to the Government of Japan submitted by the Government of Uganda, dated April 7, 1994, were modified as follows at the time of the basic design study based on the contents of the minutes of meeting on the project-type technical cooperation concluded in July 1995.

(1) Training Courses

The original request of the Ugandan side aimed at offering the Upgrading and Apprenticeship courses. However, it was modified to include the basic training course additionally.

(2) Training Fields

The original request envisaged such five training fields as metal machining and machinery fitting, electrical installation, welding and fabrication, motor vehicle mechanics and carpentry & joiner. It was modified, however, to cover the following seven fields, which were agreed upon in the minutes of meeting of the project-type technical cooperation.

1. Machining
 2. Electricity
 3. Welding
 4. Sheet metal
 5. Motor vehicle
 6. Electronics (Newly added)
 7. Carpentry
- } (the welding/sheet metal field in the original request was divided into two individual fields)

(3) Number of the Trainees to be Accepted

The original request envisaged acceptance of up to 400 trainees a year, but the number of trainees to be accepted was increased to 728 a year as a

result of the expansion of the training courses and the fields of training.

(4) Facilities

- ① Rehabilitation and expansion of the workshop
(expansion: 7,380 m²)
- ② Rehabilitation of administration building to a lecture building
(rehabilitation: 1,185 m²)
- ③ Expansion of administration building
(expansion: 1,500 m²)
- ④ Rehabilitation and expansion of the trainees' hostel
(expansion: 1,500 m²; rehabilitation: 710m²)
- ⑤ Rehabilitation and expansion of trainees canteen
(rehabilitation: 385 m²)
- ⑥ Rehabilitation and expansion of the staff quater

Total (expansion : 10,380 m²
rehabilitation : 2,280 m²)

(5) Training Equipment

- ① Common and general use
- ② Machining field
- ③ Electricity field
- ④ Welding field
- ⑤ Sheet metal field
- ⑥ Motor vehicle field
- ⑥ Electronics field
- ⑦ Carpentry field

CHAPTER 2 CONTENTS OF THE PROJECT

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2-1 Objectives of the Project

2-1-1 Vocational Training Plan

The project-type technical cooperation is scheduled to be implemented by the Government of Japan from 1997 at Nakawa Vocational Training Institute to meet the increasing social demand for vocational training in the country. Objectives of this project are rehabilitation and expansion of institute's existing facilities necessary for implementation of the vocational training plan formulated under the project-type technical cooperation programme. In this context, the basic concept of the Project is determined by the contents of the said vocational training plan which the governments of the two countries have already agreed upon. The outline of the vocational training plan formulated under the project-type technical cooperation is as described below.

(1) Training Courses

At present, Nakawa VTI is offering two training courses, "Upgrading Training Course" and "Apprenticeship Training Course" for skilled workers. Under the vocational training plan, "Basic Training Course" for new 0 level secondary school graduates will be added to the above-mentioned existing two training courses at the institute.

Table 2-1 Training Courses

Course	Period		Trainees	Qualification
1. Basic Training Course	2years (44weeks/years)		12/dept. year	<ul style="list-style-type: none"> ● 0 level ● Tuition to be paid by trainees.
2. Upgrading Training Course	4~6 weeks	5 times/ years	12/dept. year	<ul style="list-style-type: none"> ● Workers ● Tuition to be paid by company.
3. Apprenticeship Training Course	6 weeks		12/dept. year	<ul style="list-style-type: none"> ● Unskilled ● Tuition to be paid by company.

(2) Training Department

At present, Nakawa VTI is offering "Upgrading Training Course" and "Apprenticeship Training Course" (each course offered for 4 training fields). When the project-type technical cooperation programme is implemented, training fields offered will be machining, electricity, welding, sheet metal, motor vehicle, electronics and carpentry.

2-1-2 Facility/Equipment Plan

The range of the facilities and equipment to be procured under the Project must reflect contents of the project-type technical cooperation which will be extended to Nakawa VTI.

(1) Facility Plan

It is judged to be necessary that Nakawa VTI should be provided with the following facilities for the smooth implementation of the above-mentioned vocational training programme of the project-type technical cooperation.

Table 2-2 Outline of Necessary Facilities

Category	Facilities
Training	Workshop : Machining workshop, Electricity workshop, Welding workshop, Sheet metal workshop, Motor vehicle workshop, Electronics workshop, Carpentry workshop
	Lecture : Classroom, Instructors' room, Drafting room
Administration	Office : Administration office, Principle's room, Dy. principal's room, Printing room, Meeting room
	Others : Substation, Water tank, Septic tank
Accommodation	Dining : Mess hall, Kitchen
	Dormitory : Bed rooms (for men and women)

(2) Equipment Plan

It is planned that items of training equipment will be procured under the project-type technical cooperation. In working out the equipment plan,

therefore, it is necessary to clarify the distinction and the mutual relation between this project and the project-type technical cooperation to decide on the types and quantities of equipment. It is judged to be necessary that Nakawa VTI should be provided with the following items of equipment for the efficient implementation of the vocational training programme.

Table 2-3 Outline of Necessary Equipment

Training Field		Main item of equipment
Common and general use	Heat treatment/ Casting/ Forging	Oil fired furnace, Muffle furnace, Salt bath, Crucible furnace (tilt type), Air drop hammer
	Testing	Universal testing machine, Microscope, Sample polishing table, Surface roughness tester, Universal projector
	Audio visual	Overhead projector, Slide projector
	Drawing	Drawing instrument set, Drawing board, Drawing machine
	Printing	Photocopier, Stencil printer, Tracing table
	Classroom	Table, Chair, Blackboard
	Clinic	Examination bed, Doctor's desk/ chair
	Kitchen	Refrigerator, Freezer
	Dormitory	Bed, Chair
	Vehicle	Mini bus, 4WD Wagon, Cargo truck
Technical training use	Machining	Lathe, Surface grinder, Radial drilling machine, Universal tool grinder, Hobbing machine, Vertical milling machine, Shaper, Double head grinder, Boring machine, Slotter
	Electricity	Induction motor, Electric winding machine, Portable volt/ampere meter, Power factor meter, Synchroscope, Cut motor, Prefabricated refrigerator, Fan coil unit
	Welding	AC/DC arc welder, MAG/MIG welder, Spot welder, Shearing machine, X-ray apparatus, Band sawing machine, Belt sander, Buffing machine, Tool microscope
	Sheet metal	Portable spot welding machine, Squaring shear, Lever shear, Press brake, Crank press, Frame repair system, Roll forming machine, Port power set, Universal bending machine
	Motor vehicle	4-pole lift, Cylinder boring machine, Valve refacer, Headlight tester, Side slip tester, Engine tuner, Injection pump tester, Chassis dynamometer, Engine dynamometer, Cylinder honing machine
	Electronics	Synchroscope, Color TV, Personal computer, Pattern generator, Frequency counter, Portable volt/ampere meter, Sweep generator, Circuit trainer
	Carpentry	Hand feed planer, Circular saw with tilting arbor, Band sawing machine, Wood lathe, Dovetailing machine, Hollow chisel mortiser Tenoning machine, Jig saw machine, Universal tool grinder, Wood press, Belt sander

2-2 Basic Concept of the Project

2-2-1 Examination of the Contents of the Request

(1) Examination of the Appropriates of the Training Fields

At the time of the basic survey for the project-type technical cooperation in March 1994, the Government of Uganda's request included vocational training in the fields of molding, tool and die making, furniture making, block laying, molding, refrigerating/air conditioning, radio/TV, in addition to the existing fields of electricity, welding, motor vehicle and machining. However, above request was readjusted to three new fields of sheet metal, electronics and carpentry in addition to the existing four fields and formally requested to the technical cooperation team in June, 1995. Based on this request, contents of the request to this grant aid project was modified accordingly.

Regarding the three new fields, trainings in sheet metal and carpentry are presently conducted at Jinja VTI and Lugogo VTC. Judging from the fact that the request of these two fields were made based on the past achievements, it is judged necessary and appropriate to add these two fields to the training programme of the Nakawa VTI. On the other hand, training in electronics is centered on repair of radios and TV sets. In view of the fact that radios and TV sets are coming into widespread use in the country, there is a strong need of a vocational training in electronics. Since no such course is conducted at the other governmental vocational training institutions, it is also appropriate to include training field of electronics in this project.

(2) Examination of the Appropriateness of the Training Courses

When this project is implemented, Nakawa VTI will be positioned as the top of the five vocational training institutions operating under the the Ministry of Labour and Social Welfare. At present, Nakawa VTI is offering the upgrading training course and the apprenticeship training course for company employees. But many of its vocational training courses are designed in accordance with requests of companies, and as a result, Nakawa VTI is still unable to nurture human resources that fully meet Ugandan society's labour demand. It is essential, therefore, for Nakawa VTI to offer the basic training course for new 0 level secondary school graduates with the aim of nurturing human resources required by Uganda's industry.

(3) Number of Trainees to be Accepted

Breakdown of the annual number of trainees at Nakawa VTI, which is planned to be 728 in the request, is as shown below.

Upgrading and apprenticeship training courses	
16 (trainees per course) × 7 (fields) × 5 (annual number of course)	
=	560
Basic training course	
12 (trainees per course) × 7 (fields) × 2 (grades)	
=	168
<hr/>	
total	728

At present, Nakawa VTI is implementing a plan of accepting about 380 trainees every year. According to the request, Ugandan side is planning to double the annual number of trainees accepted. In 1994, however, the actual annual number of trainees accepted was about 239, which is 60 percent of the planned annual number of trainees accepted. Therefore, it is questionable that as many as 728 trainees can be accepted a year

Immediately after the completion of this project. In consideration of above situation, it deems necessary to set a more appropriate number of trainees to be accepted every year in deciding on the contents of the Project.

While the number of trainees to be accepted in each field of the basic training course is 12, that for the upgrading and apprenticeship courses is 16. Since trainings in the same field are conducted using common facilities and equipment, it is advantageous for efficient facility planning to make all courses have same number of trainees. It is judged appropriate to make the number of trainees to be accepted in each field of the three training courses be 12. In this case, the annual number of trainees accepted at Nakawa VTI is 588.

2-2-2 Examination of the Basic Design Conditions

As a result of examining the requested facilities and equipment based on the investigation results of the existing facilities and equipment, the basic design directions are set as follows.

(1) Facilities

① Workshop

The roofs and exterior walls of the existing buildings A and B have become so superannuated that they have to be repaired. The existing steel structures are in good condition and therefore can remain as they are for rehabilitation. The existing concrete floor slabs can also remain since they have no cracks. In case heavy equipment is to be installed, the existing concrete floor slabs need to be removed for construction of a new individual footing.

In planning the workshops for 7 training fields, a classroom and a instructors' room will be attached to each workshop as a rule. Direction of workshop planning is stated as follows;

- Motor vehicle workshop

Existing workshop A is used for training in motor vehicle and contains special facilities such as a floor pit for car inspection. It will therefore be inefficient to relocate motor vehicle training facilities to other building. For this reason, existing workshop A should be continuously used for motor vehicle training under this project.

- Carpentry workshop

Painting facility of motor vehicle workshop can also be used for training in carpentry. Therefore, carpentry workshop should be located adjacent to the existing workshop A. The store room for finished woodwork should be located within the existing workshop A so that painted products will not be exposed to outside air till dried.

- Welding workshop / Sheet metal workshop

Since trainings in welding and in sheet metal are closely related to each other, the training facilities for both fields should be planned as one body. In order to put together the facilities related to metal processing, the facilities for these two fields should be located adjacent to the existing forge/foundry workshop.

- Machining workshop, Electricity workshop and Electronics workshop

A new workshop shall be planned for training in machining, electricity and electronics. In order to minimize the construction cost, three workshops should be combined in one building. In view of the fact that large-size materials for use in training are frequently transported into and out of the machining workshop, it shall be located in the place where access from the service road is easy. The electronics workshop shall be located on the edge of the project site so that the effects of the vibration and noises from the other training facilities may be minimized.

The basic concept of the design of the training facilities is as illustrated below.

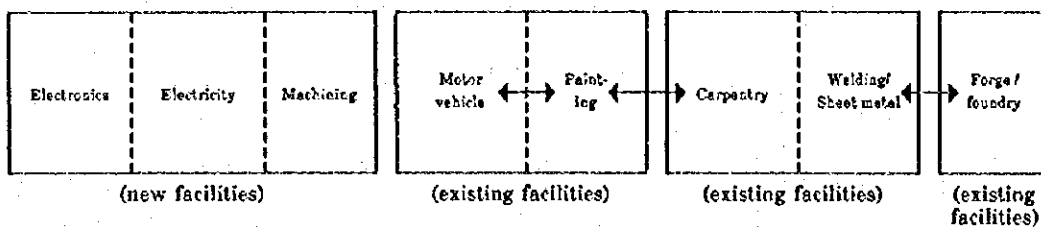


Fig. 2-1 Arrangement of the Training Facilities

The Ugandan side requested the construction of brick/block training facilities, which field is not included in the training programme of the project-type technical cooperation. Since this project is aimed at supporting training programme of the project-type technical cooperation, it is not appropriate to include the construction of such facilities in the Project.

- ② Classroom

Classrooms are to be used for lectures, which account for 25 percent of the total training time. At present, there are 4 classrooms and

one drafting room within the existing administration building. The Ugandan side requested 7 classrooms, one drawing room and a lecture hall. If classrooms are shared by the 7 training fields instead of assigning each field to a specific classroom, it will be sufficient to provide a drawing room and 6 lecture rooms, totaling seven rooms. Since a lecture hall is not indispensable for vocational training, it will not be included.

④ Administration/Lecture Building

As it is planned to expand the administration department in keeping with the expansion of the training courses as well as fields and also the increase in the number of trainees, the Ugandan side requested construction of a new administration building in which a library and a clinic are accommodated. There are a principal's office, an instructors' room, an administration office and 4 classrooms within the existing administration building, but part of the building are not used by the institute. It will be possible, therefore, to accommodate the requested administration facilities and classrooms within the existing administration building by means of effective rehabilitation planning. For this reason, the construction of a new administration building will not be included in this project. A central library for common use will not be included in the project but necessary literature will be kept in each workshop. Two rooms of the trainees' dormitory can be diverted to a clinic. The work to repair the existing buildings will include replacement of asbestos cement slate roofs and suspended ceilings, as well as repainting.

④ Trainees' dormitory

The existing trainees' dormitory has 40 rooms (each for 2 trainees) and therefore can accommodate a total of 80 trainees. The Ugandan side requested the construction of trainees' dormitories, which can accommodate 160 trainees in total, and attached facilities such as toilets. The rationale for the request is 100 percent accommodation for the trainees who are enrolled in the institute simultaneously. Since it is not compulsory for the trainees to stay in the dormitory it will be appropriate to set the capacity of the new trainees' dormitory at about 80 percent of the total number of trainees. As to the existing trainees' dormitory, which is to accommodate trainees enrolled in the upgrading and apprenticeship courses, the buildings shall be rehabilitated by means of replacing asbestos cement slate roofs and repainting. Out of its 40 rooms, two are to be diverted to clinic under this project. As to the new trainees' dormitory, which are to be two buildings having 33 rooms in total for the trainees enrolled in the basic training course. On the assumption that female trainees will be enrolled in the institute in the future, one of the new trainees' dormitory should be equipped with toilets and shower rooms for women. Since the trainees to take the basic training course are new O level secondary school graduates, each room accommodates four trainees with two double deck beds installed in each room. The specifications of the new trainees' dormitories should be similar to those of the existing trainees' dormitories.

Existing trainees' hotel:

$$\text{Rate of accommodation} = \frac{38 \text{ rooms} \times 2 \text{ trainees/room}}{12 \text{ trainees} \times 7 \text{ courses}} \times 100 = 90\%$$

New trainees' hostels:

$$\text{Rate of accommodation} = \frac{33 \text{ rooms} \times 4 \text{ trainees/room}}{12 \text{ trainees} \times 7 \text{ courses}} \times 100 = 79\%$$

As to the toilets and shower rooms, the existing lavatory building shall be rehabilitated and at the same time new lavatory of the same scale shall be constructed to cope with expansion of the dormitory. Rehabilitation of the existing lavatory shall include replacement of asbestos cement slate roofs and repainting.

⑤ Mess hall

The existing mess hall shall be rehabilitated. Based on the assumption that the maximum number of persons of about 300 (250 trainees and 50 staff members) take lunch in the mess hall in three shifts, the mess hall should have a seating capacity of 100. It will be possible, therefore, to cope with expansion of the institute with the existing mess hall. All the superannuated pieces of kitchen equipment shall be replaced so that the kitchen may cope with the future increase in workload.

⑥ Staff quater

The Ugandan side requested rehabilitation and expansion of the existing staff quater. Since the staff quater is the facility for individual personnel, its priority is judged to be low. Therefore, they should not be included in this project.

⑦ Electrical facility

Low-voltage electric power is received for the existing facilities. When this project is implemented, however, power receiving system shall be changed from low-voltage to high-voltage to cope with the

increase in the power capacity of the equipment. As to the telephone lines, the number of telephone lines should be increased since the present two telephone lines will not be sufficient to cope with the future increase in the number of calls. It will also be necessary to make a review of the entire existing electrical facility all over since deteriorated or damaged parts are observed.

③ Sanitary facilities

City water is supplied directly to the existing facilities. These facilities are therefore directly affected by the cut off of water supply. Though small water tanks are installed in the existing buildings, the total capacity of these small tanks is not sufficient. From the standpoint of securing stable water supply, the present water supply system and supply routes shall be reviewed all over.

As regards the drainage system, the existing drainage routes shall be reviewed all over due to its sanitary problems. In planning new drainage system, emphasis is placed on the improvement of the septic tank. The existing kitchen equipment is not usable any longer due to obsolescence and cooking is done by the use of charcoal at present. Therefore, all the existing items of kitchen equipment shall be replaced to cope with the future increase in workload.

(2) Equipment

1) Existing Equipment

Most of the existing items of equipment were installed in 1969 with the financial assistance of the Government of Japan, and have been in use for more than 25 years. Some of them, as a result, are now unusable or unable to perform their original functions due to wear, damage or loss of spare parts. And it seems to be difficult to repair

them by replacing parts because they are outdated. Even those items which are still usable are very superannuated, posing problems in precision and safety in operation, and are therefore cannot be used for training purpose. For these reasons, it is appropriate to replace almost of all the existing items excepting those tools and measuring instruments which are well maintained, and also, a tensile strength testers and a universal tool grinding machines which Japanese experts have judged to be still usable. Of the items of equipment which were provided by the Government of Japan, those which have become superannuated are to be sold off or disposed in other ways by the Government of Uganda after following necessary procedure.

2) Basic Concept of the Equipment Plan

The range of the requested items of equipment are based on the contents of training under the project-type technical cooperation, which is planned to be started in fiscal 1997, and the number of trainees. In equipment plan, the following guidelines were taken into consideration as the basic concept and the appropriate level and quantities for the Project should be examined.

- ① The equipment plan should be in line with the contents (training courses, curriculum and the number of the trainees) of the training programme to be carried out under the project-type technical cooperation.
- ② Items of equipment under this project should be clearly distinguished from those under the project-type technical cooperation so that this Project may be promptly integrated into the project-type technical cooperation.

- ③ Minute care should be taken to minimize the costs of maintenance for the equipment.
- ④ The items for common use such as testing equipment or measuring instruments should be shared by the trainees of every technical field as much as possible.

The results of the examination regarding main items of equipment are summarized as follows.

① Motor vehicle field

- Equipment for engine repair

As it is considered appropriate that training in machining an engine should cover basic-level practice, a valve sheet grinder is concluded to introduce. A pinhole honing machine, included in the request, is judged to be replaced with a set of adjustable reamers for manual operation.

- Chassis dynamometer

A unit of chassis dynamometer with appropriate size for light vehicles is decided to provide since it is quite necessary to measure output power of chassis and to check function of engine.

- Equipment for safety inspection

An official safety inspection system for commercial vehicles is at present under preparation to be established in Uganda. In addition, the Ministry of Local Governments and UEB (Uganda Electricity Board) have already conducted their internal safety inspection system. Considering those conditions and facts, the necessary of car inspection equipment is considered high, for

vocational training institutions. Each of the following items therefore are decided to be introduced.

- Headlight tester ○ Wheel alignment tester
- Side slip tester ○ Brake/speedometer tester

● Painting Equipment

An air compressor with spray guns and a infrared dryer stand for practical car-body painting are planned to be installed in the painting room, which is shared with the carpentry department.

It is noted that, in Uganda, about 90% of light vehicles including micro buses, are said Japanese-made. To achieve the desired training effect as well, equipment for performance test (chassis dynamometer, alternator/starter motor tester, etc.), and safety inspection (side slip tester, brake/speed meter tester, etc.) are planned to be Japanese-made.

② Electricity field

● Power receiving and distribution equipment

A set of high/low voltage power distribution boards was requested by Ugandan side. However, a practical training on power distribution can be done with actual distribution board to be installed in the substation under the building construction work of this Project. Thus, except this item, induction voltage regulators (for single phase and three phase) and insulation voltage resistance testers are planned to be provided as they are indispensable to training on high-voltage equipment.

- Equipment for Freezer and Refrigerator repair

Freezing and refrigerating facilities used in the process of distribution of perishable foods are expected to be in great demand in Uganda. For this reason, of the requested items of equipment, the following basic items will be introduced under this project.

- Air conditioner (separate type)
- Refrigerator and Freezer
- Pipe threading machine
- Cleaner and assorted tools for air conditioner

⑥ Welding

- Welders

A total of 12 AC arc welders is planned to be installed in the welding booths as means of acquiring basic operation of electric welding. MAG, MIG and TIG welders, requested 5 units each, are suited for welding stainless steel and non-ferrous metals such as aluminum. However, considering that they have not yet come into very common use in Ugandan industries and therefore, reducing the quantity, it was concluded that one unit each of those welders would be introduced. A non-gas welder, a plasma welder/cutter and a submerged arc welder are decided to be excluded from the plan since they are still in limited demand in Uganda.

- X-ray apparatus

An X-ray apparatus was requested for the purpose of non-destructive test of welded part. However, judging from difficulty to procure suitable X-ray films and particular chemical (SF6) necessary to generate X-ray, this item is not

recommended for this Project. A bending tester, instead, will be introduced for testing a strength of welded joints.

- **Hardness testers**

Vickers and Shore hardness testers are considered indispensable for analysis of physical properties of metals. Those items will also be necessary for training in mechanical field. For these reasons, one unit each of them are planned to be installed in common testing room.

⑥ **Machining field**

- **Lathe**

This item is indispensable for training in basic techniques of turning. The Ugandan side requested 8 units of medium-sized lathe (distance between centres: 800mm) and 4 units of large-sized lathe (distance between centres: 1,500mm). It was decided to provide 8 units of medium-sized one as requested. Additionally, two units of large-sized one are planned for the purpose of machining a longer work piece, which is mainly used in upgrading course. A set of copying apparatus will be attached to one of the medium-sized lathe as an accessory.

- **Milling Machine**

One unit each of horizontal and universal type and two units of vertical type were requested for practice of milling work. However, the quantity was judged to reduce for the reason of frequency in use. Thus, one each unit of universal type and vertical type was recommended for the Project. That may not be an obstacle to training as a universal type can be converted to horizontal type changing milling head.

- Equipment for machining sheet metal

A shearing machine, a lever shear and a universal bending machine were requested together with a screw press and three roll machine. However, it is recommended to share the same items which are planned to be installed in the welding workshop since the necessity of such items are not considered high in machining field.

- ⑦ Heat treatment/Casting/Forging equipment

- To provide a basic practical training on heat training such as quenching and annealing of steel materials and casting in sand mold, the following equipment is planned to installed in the foundry workshop.

- Oil fired furnace
- Salt bath and oil quenching bath
- Tilting type crucible furnace

- ⑧ Common and general use equipment

- According to the training plan, a lecture room will be provided with a number of tables and chairs to match its capacity. A kitchen will have two units each of refrigerators and freezers; a trainee's dormitory will have a number of beds, chairs, and doctor's desk with chair, etc.