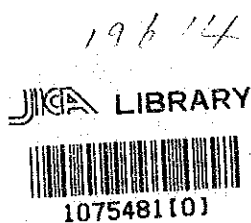


**BASIC DESIGN STUDY REPORT
ON
THE PROJECT FOR THE IMPROVEMENT AND EXPANSION
OF
JOMO KENYATTA UNIVERSITY COLLEGE OF
AGRICULTURE AND TECHNOLOGY (JKUCAT)
IN
THE REPUBLIC OF KENYA**

MAY 1989

JAPAN INTERNATIONAL COOPERATION AGENCY

BASIC DESIGN STUDY REPORT
ON
THE PROJECT FOR THE IMPROVEMENT AND EXPANSION
OF
JOMO KENYATTA UNIVERSITY COLLEGE OF
AGRICULTURE AND TECHNOLOGY (JKUCAT)
IN
THE REPUBLIC OF KENYA



MAY 1989

JAPAN INTERNATIONAL COOPERATION AGENCY

国際協力事業団

19614

PREFACE

In response to a request from the Government of the Republic of Kenya, the Government of Japan has decided to conduct a Basic Design Study on the Project for the Improvement and Expansion of Jomo Kenyatta University College of Agriculture and Technology and entrusted the study to the Japan International Cooperation Agency (JICA).


JICA sent to Kenya a survey team headed by Dr. Junkichi Iwasa, Professor, Faculty of Agriculture, Okayama University, from January 15 to February 11, 1989.

The team exchanged views with the officials concerned of the Government of Kenya and conducted a field survey in the Nairobi area. After the team returned to Japan, further studies were made. Then a mission was sent to Kenya in order to discuss a draft report, and the present report has been prepared.

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

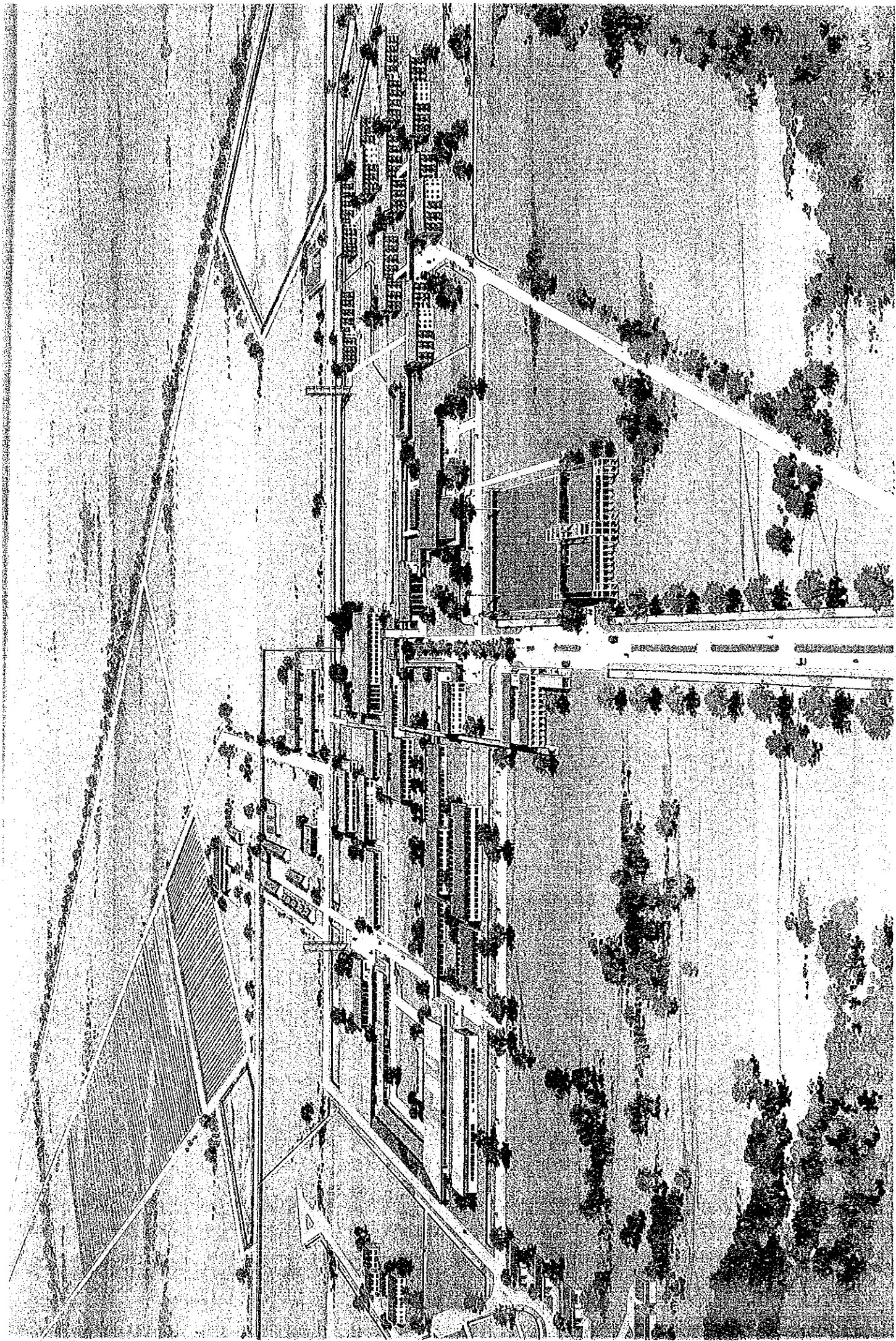
I wish to express my sincere appreciation to the officials concerned of the Government of the Republic of Kenya for their close cooperation extended to the team.

May, 1989

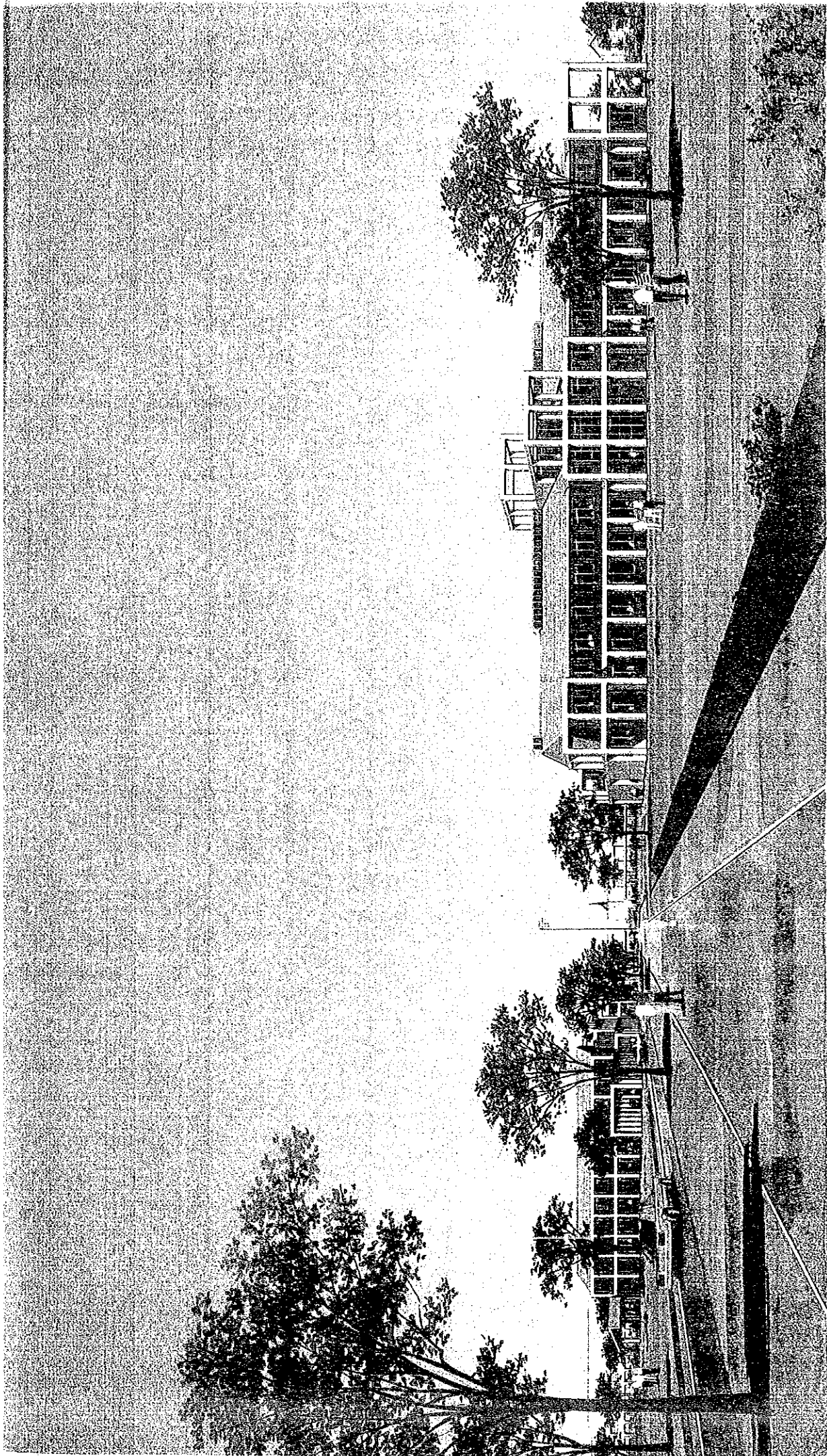


Kensuke Yanagiya
President

Japan International Cooperation Agency

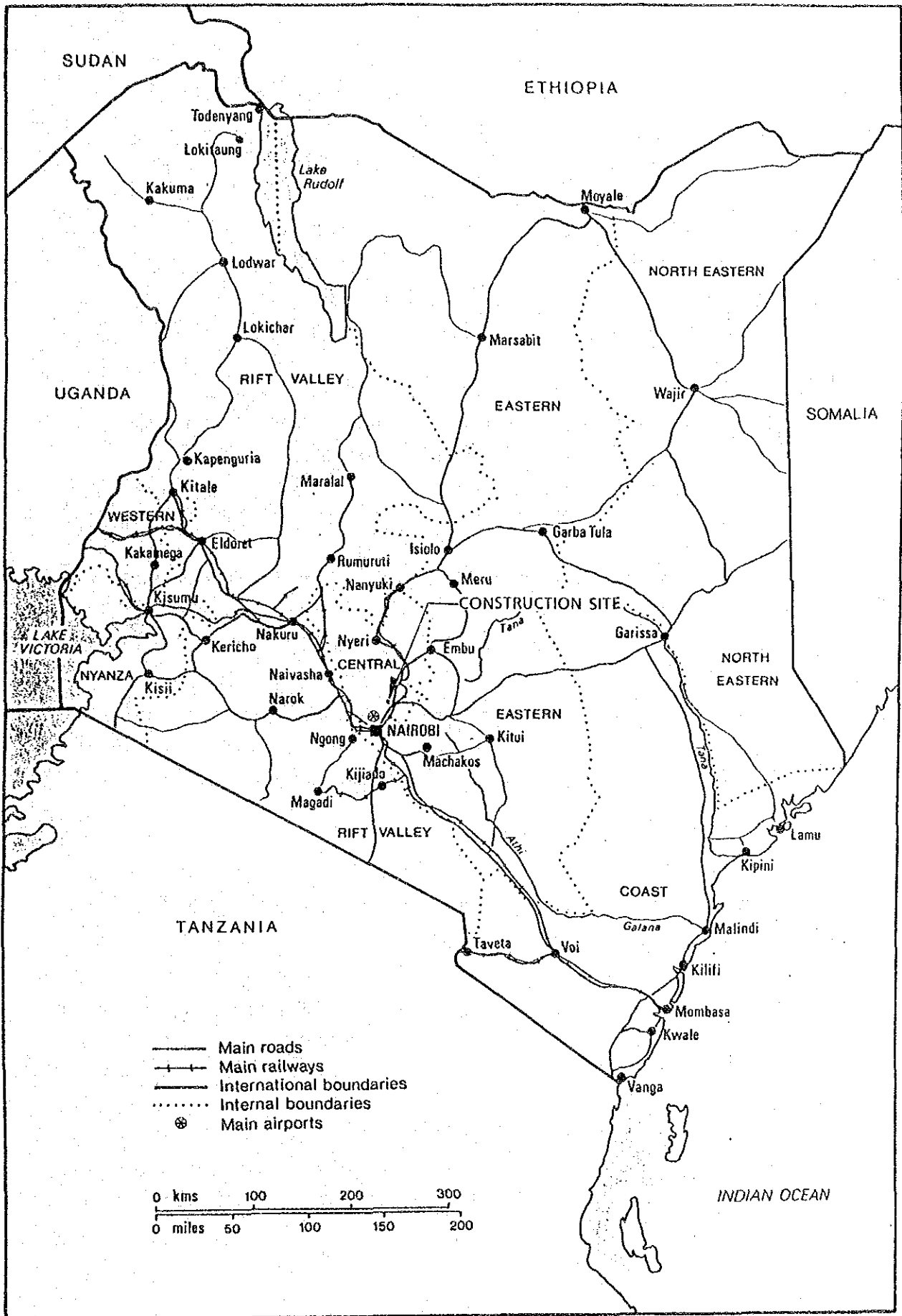


JOMO KENYATTA UNIVERSITY COLLEGE OF AGRICULTURE AND TECHNOLOGY (JKUAT)



JOMO KENYATTA UNIVERSITY COLLEGE OF AGRICULTURE AND TECHNOLOGY (JKUCAT)

Kenya



SUMMARY

Since Kenya's independence in 1963, the Government of the Republic of Kenya has been implementing a series of national development plans to promote the country's socio-economic development. While economic development steadily advanced in the 1970s, however, the budgetary deficit has been increasing in the 1980s due to the aftereffects of the second oil crisis, the low prices of such major export commodities as tea and coffee and stagnant agricultural production due to droughts. In fact, the target real GDP growth rate has been continuously downwardly revised since the Second National Development Plan.

Against this background, the Government of Kenya reviewed its economic development policies in 1986 and prepared a long-term economic development plan to cover the period between 1986 and 2000 and to clearly present the desired image of the Kenyan economy which can respond to structural changes of the world economy.

This plan aims at increasing employment opportunities by continuous economic growth in view of an estimated population increase from the present 23.5 million to 35 million in the year 2000. The basic target of the plan is the achievement of an average annual GDP growth rate of 5.6% throughout the period in question. Population control by means of family planning, increased employment, preferential distribution of resources to the agricultural sector and vitalization of the industrial sector are currently in progress as priority policies to achieve this target growth.

The Government of Kenya has also been conducting educational reform (replacement of the old 7-4-2-3 educational system by the 8-4-4 educational system) with emphasis on the promotion of technical education on the grounds that the development of manpower, especially manpower equipped with strong theoretical knowledge and technical skills, through higher education is extremely important to achieve the Kenyanization of Kenya's economy and industries.

The Government of Kenya is now actively trying to expand university education to consolidate higher education in Kenya in order to meet the strong social demand for manpower with a high level of technical skills.

The immediate expansion of university education is indeed an important and pressing task for the Government of Kenya in view of the facts that the number of students receiving higher education has rapidly increased in recent years following the population increase and that there will be a substantial increase of applicants for university education in September 1990 with the graduation of those students currently attending secondary schools under both the old and new systems.

Under these circumstances, in August 1988 the Government of Kenya decided to upgrade the Jomo Kenyatta College of Agriculture and Technology (JKCAT) to the Jomo Kenyatta University College of Agriculture and Technology (JKUCAT) as a constituent college of Kenyatta University as part of the rapid expansion measures for existing universities in order to increase the number of university places.

Following this decision, JKUCAT (ex-JKCAT) revised the Master Plan for the expansion of JKCAT and the Government of Kenya prepared the Project for the Improvement and Expansion of JKUCAT based on the revised Master Plan and requested the Government of Japan's provision of grant aid assistance and project-type technical cooperation for the Project.

In response to this request, JICA sent a Consultation Team and Basic Design Preliminary Study Team to Kenya in August 1988 to confirm the contents of the request, examine the necessity and suitability of the assistance and check the progress of the technical cooperation currently in progress at JKUCAT.

These teams concluded in their reports that the possibility of providing grant aid assistance and technical cooperation for JKUCAT Expansion Project, thereby upgrading JKCAT to a constituent college, should be urgently examined as a means of solving Kenya's pressing problems, including the necessity to expand higher education, originating from Kenya's current social conditions.

The Government of Japan subsequently decided to conduct a Basic Design Study and JICA sent a Basic Design Study Team to Kenya for a period of 28 days between January 15 and February 11, 1989. The Basic Design, Equipment Plan and Maintenance Plan, etc., were prepared based on the above study and survey results in addition to the results of studies and analyses in Japan. The Government of Japan then sent a Basic Design Draft Final Report Explanatory Mission to Kenya for a period of 14 days from May 9, 1989.

The Basic Design Study Team concluded that fiscal 1994/95 should be the target year for project completion with a projected number of students at that time of 1,372. The Study Team also concluded that the provision of the facilities required for the new courses to be introduced by JKUCAT was appropriate and prepared the optimal plan for the implementation of the Project. In regard to the water shortage on the campus which has been a pressing problem for several years, the construction of a water purification plant under the Project has been decided in view of the problem's urgency.

- **New Courses**

As JKUCAT has now been upgraded to a constituent college, the introduction of the following new courses is planned: Horticulture, Agricultural Engineering (Agricultural Civil Engineering Course, Agricultural Mechanical Engineering Course), Food Technology and Postharvest Technology Bachelor Degree Courses in the Faculty of Agriculture, Civil Engineering Bachelor Degree Course in the Faculty of Engineering and Architecture Course, Electrical and Electronics Engineering (Electrical Engineering Course and Electronics Engineering Course), Mechanical Engineering (Automobile and Prime Movers Engineering Course and Production Engineering Course) Higher National Diploma (HND) Courses in the Faculty of Engineering.

- **Existing Courses**

The Ordinary Diploma (OD) courses currently conducted by the Departments of Horticulture, Agricultural Engineering and Food Engineering will stop accepting new admissions in fiscal 1994/95 and the courses will be completely withdrawn with the graduation of the last students. The technician courses of the Faculty of Engineering will stop accepting new admissions in fiscal 1989/90 and will be switched to the Ordinary Diploma (OD) courses thereafter.

The purpose of the Project is not simply the expansion of the existing facilities but also the qualitative and quantitative improvement of JKUCAT's facilities with the grant aid assistance and project-type technical cooperation of the Government of Japan through the introduction of new bachelor degree courses and Higher National Diploma (HND) courses and the increase of the number of students following the upgrading of JKUCAT to a constituent college of Kenyatta

University. These improvements also aim at consolidating the basis of JKUCAT for its further upgrading to a full fledged university in the future.

The subject site of the Project is JKUCAT campus with an area of some 200ha which is located some 40km northeast of Nairobi in Thika Division, which is in Kiambu District of Central Province.

The area around the project site has many sisal, coffee, tea and pineapple estates, and Juja Village, which has a population of some 5,000, has been spontaneously established, mainly by the estate workers. Thika, a busy city with a population of some 50,000, is located 10km northeast of Juja and acts as the local administrative centre. The Ndargu River flows 1km northeast of the project site and is used for irrigation water intake for JKUCAT's farm. The water purification plant planned under the Project will also use water from the Ndargu River. Power is already supplied to the substation on the campus and the provision of additional telephone lines following JKUCAT's expansion has been confirmed. The Government of Kenya is preparing to commence the banking and road construction work and the placing of drainage pipes from the campus to the sewage treatment pond which are required for the construction of the new buildings.

The facilities and equipment whose construction/provision have been decided in the Basic Design are as follows:

Facilities

Faculty of Agriculture

- Agricultural New Laboratory Building 1,404m²
2-storey, reinforced concrete building housing the laboratories of the Departments of Horticulture and Food Technology, lecture room, drawing room and lecturers' rooms, etc.
- Agricultural Engineering Laboratory Building 845m²
single story, reinforced concrete building
- Agricultural Engineering Workshop Building 1,080m²
single story, steel-frame building
- Soil Sterilization Building 25m²
single story, concrete block building

Faculty of Engineering

- Engineering New Laboratory Building 2,318m²
2-storey, reinforced concrete building housing the laboratories and workshop of the Departments of Building and Civil Engineering, Mechanical Engineering and Electrical and Electronics Engineering, lecture room, printing room and lecturers' rooms, etc.
- Civil and Mechanical Engineering Laboratory Building 1,224m²
single storey (with a mezzanine), steel-frame building housing the laboratories and lecturers' rooms of the Departments of Building and Civil Engineering and Mechanical Engineering
- Machinery Hard Standing Building 420m²
single storey, steel-frame building including a maintenance workshop

Common to Both Faculties

- New Common Lecture Building 2,199m²
2-storey, reinforced concrete building housing the laboratories and lecture rooms for common subjects and computer room, etc.
- Water Purification Plant 516m²
2-storey (reinforced concrete in part) building housing water purification plant and auxiliary facilities
- Library Building 2,237m²
2-storey, reinforced concrete building housing reading room, book stacks, reference room, work-room, binding room, audiovisual room, Librarian's room, meeting room and offices, etc.
- New Administration Building 1,354m²
2-storey, reinforced concrete building housing Chairman of the Board's room, Principal's room, Deputy Principal's room, conference room, Project Leader's room and offices, etc.
- Canteen Building 450m²
single storey, reinforced concrete building housing canteen and kitchen

Total Floor Area 14,072m²

Equipment

Faculty of Agriculture

equipment for the Departments of Horticulture, Agricultural Engineering and Food Technology

Faculty of Engineering

equipment for the Departments of Building and Civil Engineering, Electrical and Electronics Engineering and Mechanical Engineering

Common to Both Faculties

common equipment for the Faculties of Agriculture and Engineering

In view of the facility sizes and the required construction periods, it has been decided that project implementation in three phases will be the most appropriate. The common lecture building and water purification plant will be constructed and related equipment provided in the first phase, while the laboratory buildings for both faculties will be constructed and related equipment provided in the second phase. In the third phase, the library, administration and canteen buildings will be constructed and the planned conversion of the existing buildings will be conducted. The required construction periods will be approximately 9 months for the first phase, approximately 12 months for the second phase and approximately 10 months for the third phase.

The Ministry of Education will be the implementation agency on the Kenyan side and the Permanent Secretary for Education will bear the overall responsibility for the implementation of the Project. JKUCAT is considered to have the status as the fifth university following to Kenya's four existing universities and its operation is controlled by the University College Academic Board which is the equivalent of a faculty council in Japan, and is in turn supervised by the University College Council which is the supreme decision-making organization of JKUCAT. The organization of JKUCAT will consist of the Administration, Finance, Farm Management and Library Section, the Faculties of Agriculture, Engineering, Science and Social Science and Student and Academic Sections, etc., under the Principal. JKUCAT will have a total of 932 staff, i.e., 232 teachers, 262 nonteaching staff and 438 management staff (77 officers and higher ranks and 361 ordinary staff), in the target year of the Project (fiscal 1994/95).

The implementation of the Project is expected to have the following effects.

- 1) As Kenyan society requires manpower with a strong technical background to promote local development in diverse fields, the fostering of this manpower by JKUCAT will provide local communities with expert knowledge and techniques and will contribute to the overall development of the country by solving immediate policy problems and assisting the improvement of national policies.
- 2) While the Government of Kenya is actively trying to promote several important policies at present, improved productivity is particularly stressed in the field of agriculture, and promotion of agriculture is planned based on a scientific approach with utilization of a combination of agricultural technologies. In the field of industry, the development of import-substitution industries and other small but productive industries is particularly stressed. In view of the active promotion of these policies, JKUCAT graduates (i.e., 160 from bachelor degree courses and 120 from HND courses every year) are expected to act as reformers in rural areas and managers in small-scale import-substitution industries, indicating the importance of JKUCAT in meeting the demand for manpower in these fields.
- 3) With the increase of the population, the improved school attendance rate and the increasing number of high school graduates with the necessary qualifications for university entrance in recent years, there is a strong social demand to increase the number of university places. The number of qualified applicants is expected to substantially increase in 1990 as those secondary school graduates under the new educational system will join those qualified under the old system. Following its upgrading to a constituent college (and a full fledged university in the future), the expansion of JKUCAT will have a direct effect on the solving of Kenya's pressing education problems.
- 4) The implementation of the Project is also expected to have the indirect effect of assisting the general improvement of the intellectual level of the people, spreading knowledge and stimulating the cultural development of the country.

JKUCAT Project, therefore, will play an extremely important role in the socio-economic development of Kenya by means of assisting the expansion of higher education which is currently being promoted by the Government of Kenya and by fostering a large number of highly capable engineers who are required for the Kenyanization of the economy. In conclusion, the implementation of the Project with the grant aid assistance of the Government of Japan will have a

significant meaning for both countries. With the planned commencement of the project-type technical cooperation in April, 1990, the facilities to be constructed under the Project will prove extremely useful to achieve the maximum effect of the technology transfer under the technical cooperation. The Project should, therefore, have a far reaching effect on education in Kenya with substantial effects on Kenya's socio-economic development.

CONTENTS

PREFACE

LOCATION MAP AND PERSPECTIVE

SUMMARY

ABBREVIATIONS

CHAPTER 1 INTRODUCTION	1
CHAPTER 2 BACKGROUND OF THE PROJECT	5
2.1 Outline of Kenyan Society and Economy	5
2.2 Outline of Education	8
2.2.1 Educational Conditions	8
2.2.2 New Educational System and Higher Education	10
2.2.3 The Improvement and Expansion of Jomo Kenyatta University College of Agriculture and Technology	16
2.3 Outline of Related Plans	18
2.3.1 National Development Plans	18
2.3.2 Plans Relating to Education	18
2.4 Background and Contents of the Request	20
CHAPTER 3 CONTENTS OF THE PROJECT	25
3.1 Objectives	25
3.2 Examination of Requested Contents	25
3.2.1 Appropriateness and Necessity of the Project	25
3.2.2 Examination of Implementation and Management Plans	34
3.2.3 Examination of Requested Facilities and Equipment	35
3.2.4 Necessary Technical Cooperation	38
3.2.5 Provision of Assistance	39
3.3 Project Outline	40
3.3.1 Implementation Agency and Operation System	40
3.3.2 Planned Courses	45

3.3.3	Location and Conditions of Project Site	53
3.3.4	Outline of Facilities and Equipment	58
3.3.5	Management and Maintenance Plans	65
3.4	Technical Cooperation	76
CHAPTER 4	BASIC DESIGN	79
4.1	Basic Design Policies	79
4.2	Design Conditions	81
4.2.1	Planned Facilities	81
4.2.2	Facility Sizes	82
4.3	Basic Plan	100
4.3.1	Campus Plan	100
4.3.2	Building Plan	101
4.3.3	Water Purification Plant Plan	118
4.3.4	Equipment Plan	124
4.3.5	Drawings of Basic Design	134
4.4	Construction Plan	171
4.4.1	Conditions of Local Construction Industry and Points to Note in Construction Work	171
4.4.2	Project Implementation Policies	173
4.4.3	Construction Supervision Plan	175
4.4.4	Equipment and Materials Procurement Plan	178
4.4.5	Implementation Schedule	184
4.4.6	Estimated Project Cost	188
CHAPTER 5	PROJECT EFFECTS AND CONCLUSION	191
5.1	Project Effects	191
5.2	Appropriateness of the Project	193
5.2.1	Financing	193
5.2.2	Maintenance System	194
5.2.3	Management System	194
5.3	Conclusion	196
5.4	Recommendations	197

APPENDIX

1. Member of the Study Team	199
2. List of Persons Interviewed	201
3. Minutes of Discussions	205
4. Condition of the Construction Site	215
5. Others	219

Abbreviations

B.S	:	British Standard
B.Sc.	:	Bachelor of Science
B.Tec.	:	Bachelor of Technology
CC	:	Constituent College
CHE	:	Commission for Higher Education
E/N	:	Exchange of Notes
GDP	:	Gross Domestic Product
HND	:	Higher National Diploma
JICA	:	Japan International Cooperation Agency
JKCAT	:	Jomo Kenyatta College of Agriculture and Technology
JKUCAT	:	Jomo Kenyatta University College of Agriculture and Technology
JOCV	:	Japan Overseas Cooperation Volunteers
KPL	:	Kenya Power and Lighting Co., Ltd.
KPTC	:	Kenya Posts and Telecommunication Co., Ltd.
Ksh	:	Kenya Shilling
K£	:	Kenya Pound (1k£ = 20Ksh)
M.Sc.	:	Master of Science
MOE	:	Ministry of Education
MOF	:	Ministry of Finance
MOPW	:	Ministry of Public Works
MOWD	:	Ministry of Water Development
OD	:	Ordinary Diploma
ODA	:	Official Development Assistance
Ph.D.	:	Philosophiae Doctor
TSC	:	Teachers Service Commission
UC	:	University College

CHAPTER 1 INTRODUCTION

CHAPTER 1 INTRODUCTION

Since Kenya's independence in 1963, the Government of Kenya has given priority in its educational modernization efforts to the expansion and consolidation of primary and secondary school education and to increasing the school attendance rate. It has also adopted various educational policies to foster manpower to achieve the stability and development of the country based on the recognition that education is the basis of manpower development.

With regard to the educational system in particular, the old 7-4-2-3 educational system was changed to the 8-4-4 educational system following a proposal made by the Presidential Working Party on the Second University which was established in 1981 with the purpose of initiating educational reform to stress on technical education and to establish a second university in addition to the existing University of Nairobi. These reforms, the most substantial educational reforms since independence, aim at the provision of practical (technical) education in order to aggressively promote local development and also to encourage self-employment. In the field of higher education, the length of university education was extended from 3 years to 4 years to provide graduates with bachelor degrees in various socio-economic fields.

The Government of Kenya is now actively trying to expand university education to consolidate higher education in Kenya in order to meet the strong social requirements for manpower with a high level of technical skills.

The immediate expansion of university education is indeed an important and pressing task for the Government of Kenya in view of the facts that the number of students receiving higher education has rapidly increased in recent years following the population increase and that there will be a substantial increase of applicants for university education in September 1990 with the graduation of those students currently attending secondary schools under both the old and new educational systems.

Under these circumstances, in August 1988 the Government of Kenya decided to upgrade the Jomo Kenyatta College of Agriculture and Technology (JKCAT) to a constituent college of Kenyatta University as Jomo Kenyatta University College of Agriculture and Technology (JKUCAT) as part of the rapid expansion

measures for existing universities in order to increase the number of university places.

Following this decision, JKUCAT (ex-JKCAT) revised the Master Plan for the expansion of JKUCAT and the Government of Kenya prepared the Project for the Improvement and Expansion of JKUCAT based on the revised Master Plan and requested the Government of Japan's provision of grant aid assistance and project-type technical cooperation for the Project.

In response to this request, JICA sent Consultation Team to Kenya in August 1988 to confirm the contents of the request, examine the necessity and suitability of the assistance and check the progress of the technical cooperation currently in progress at JKUCAT. The visit, the Consultation Team was joined by Mr. Yoshikatsu Nakamura of deputy head First Basic Design Study Div., grant aid Planning & Survey Dept. JICA to confirm the Kenyan request for grant aid assistance.

Based on the Preliminary Studies, the Government of Japan decided to conduct a Basic Design Study to materialize the requested Project and JICA subsequently sent a Basic Design Study Team headed by Professor Junkichi Iwasa of the Faculty of Agriculture, Okayama University, to Kenya for a period of 28 days between January 15 and February 11, 1989. The main items of this Basic Design Study were as follows:

- 1) Confirmation of the contents and background of the Kenyan request
- 2) Study on the implementation agency and related organizations for the Project
- 3) Confirmation of the project contents
- 4) Field survey on the project site and study on the conditions of the related infrastructure
- 5) Examination of the functions and sizes of the proposed facilities and of the technical issues involved in the construction work
- 6) Reference study on similar facilities and equipment
- 7) Consultations with the Kenyan ministries and agencies involved in the construction work

- 8) Examination of the project implementation schedule and related budgetary measures of the Government of Kenya
- 9) Collection of data required to estimate the project cost

Based on the above studies and surveys and consultations with the officials concern of the Republic of the Kenya side, both preconditions for the Basic Design, the Basic Design Study Team compiled the Minutes of Discussions containing the agreed issues on the project contents, implementation agency, project site and the scope of work to be conducted by each government. The Minutes of Discussions were exchanged on January 24 1989, between Mr. Benjamin K. Kipkulei, Permanent Secretary of Ministry of Education, representing the Kenyan side, and Prof. Junkichi Iwasa, the team leader, representing the Japanese side.

The Basic Design was subsequently prepared based on the above study and survey results in addition to the results of studies and analysis conducted in Japan. JICA then sent the Basic Design Draft Final Report Explanatory Mission headed by Dr. Eiichi Watanabe of the Faculty of Engineering, Kyoto University, to Kenya for a period of 14 days between May 9th and 22th, 1989, to confirm the contents of the Basic Design with the Kenyan side and to compile the agreed issues into the Minutes of Discussions on the Draft Final Report. The Minutes of Discussions were exchanged on May 18, 1989, between Mr. Benjamin K. Kipkulei, Permanent Secretary of Ministry of Education representing the Kenyan side and Prof. Eiichi Watanabe, the mission leader, representing the Japanese side.

The present report compiles the results of the series of discussions and agreed issues between the two sides.

The members of the Basic Design Study Team, study schedule, list of persons interviewed and copies of the Minutes of Discussions are given in the Appendix.

CHAPTER 2 BACKGROUND OF THE PROJECT

CHAPTER 2 BACKGROUND OF THE PROJECT

2.1 Outline of Kenyan Society and Economy

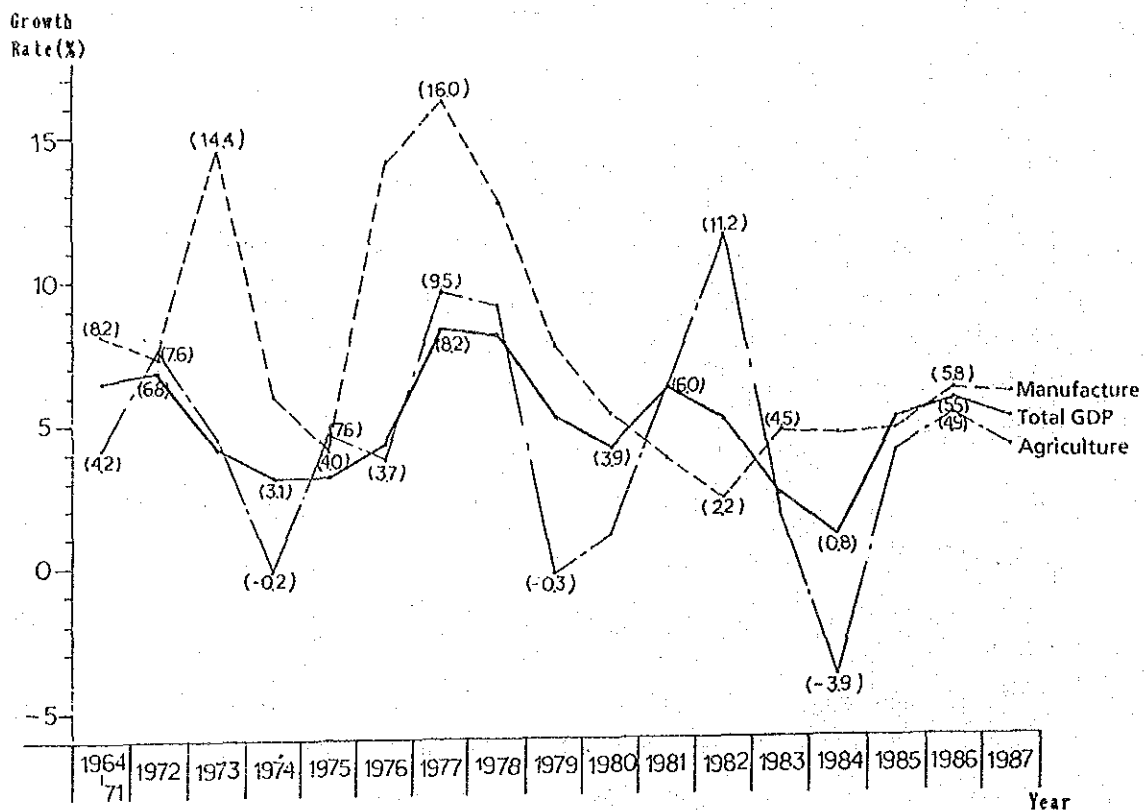
The population of Kenya, which has been increasing by 3.4% a year since 1969, reached 22.7 million in late 1988. As an annual increase rate of 3.7 - 3.8% is expected to continue up to the year 2000, the population in 2000 will total 32 - 35 million, becoming a pressing issue affecting such basic areas of national policy as food supply, education and employment.

85% of Kenya's population still lives in rural areas and 75% of the rural population is engaged in agriculture. In recent years, however, the inflow of the population into urban areas seeking employment has been accelerating and the urban population is expected to increase from its present 3 million to 9 - 10 million in the year 2000, necessitating the urgent creation of new employment opportunities in urban areas. Similarly, the number of students is rapidly increasing and most graduates seek modern jobs. While employment opportunities increased by 3% a year between 1976 and 1981, they were exceeded by the increase of the labour force by 3.8% a year, resulting in a rise of the unemployment rate from 7.1% to 10.3% in this period. This trend is continuing and the labour force (7 million in 1987) is expected to increase to 14 million in the year 2000.

Rapid changes have also been observed in the economy since Kenya's independence. While consistently supported by the manufacture of import-substitution products, the conversion from large-scale agriculture to small-scale agriculture and the introduction of value-added agricultural products, the Kenyan economy can be historically divided into the following 5 periods.

- 1964 - 1973 ... The period described as the "Miracle of Kenya" with an annual real economic growth rate exceeding 7%
- 1974 - 1976 ... The worldwide period of depression due to the first oil shock
- 1976 - 1977 ... The coffee boom with coffee and tea fetching high prices due to the large decline in Brazilian coffee production caused by frost damage; a rapid increase of domestic consumption leading to inflation in subsequent years

■ Growth Rates of Real Gross Domestic Product, 1964~87*



Year	Agriculture	Manufacture	Government Services	Others	Total GDP
1964-71**	4.2	8.2	9.8	6.9	6.5
1972	7.6	7.3	12.8	3.6	6.8
1973	4.4	14.4	6.3	1.0	4.1
1974	-0.2	5.9	6.8	4.0	3.1
1975	4.6	4.0	8.5	-0.01	3.1
1976	3.7	14.0	5.1	2.0	4.2
1977	9.5	16.0	5.1	6.1	8.2
1978	8.9	12.5	6.4	8.4	7.9
1979	-0.3	7.6	7.1	7.7	5.0
1980	0.9	5.2	5.6	5.2	3.9
1981	6.1	3.6	5.3	6.9	6.0
1982	11.2	2.2	3.8	1.4	4.8
1983	1.6	4.5	4.2	1.5	2.3
1984	-3.9	4.3	2.9	2.7	0.8
1985	3.7	4.5	4.2	1.5	4.8
1986	4.9	5.8	6.3	5.4	5.5
1987	3.8	5.7	5.7	4.9	4.8

Sources: 6th National Development Plan (1989-1993)

* 1964 prices for 1964 to 1971 and 1982 prices for 1972 onwards.

** There were extensive revisions in major series affecting GDP calculations in 1972. Any linkages between 1964 and 1982 based series should therefore be interpreted with these revisions in mind.

1978 - 1984 ... The period of depression due to the second oil shock; poor agricultural production due to extremely severe drought recorded in 1984

1985 - 1986 ... The short period of prosperity due to the coffee boom; the economy has since been in a state of depression

As the above brief history shows, the Kenyan economy which is largely dependent on such primary commodities as coffee and tea has limitations, and industrialization has so far only been achieved on a small scale. The main successful foreign currency earners are still coffee, tea and tourism which accounted for approximately 50% of the total export value in 1987, excluding nonoil products and services.

While exports have shown an increasing trend, imports have also been increasing in accordance with industrial development. With the continuous low market prices of coffee and tea in recent years, the balance of trade shows a deficit of some 300 million K.sh a year. This chronic trade deficit has so far been compensated for by the earnings of invisible items, including those of tourism and foreign loans and assistance. As a result, the external debt has rapidly increased in the last few years and the public debt ratio has risen from 4% in 1974 and 12% in 1980 to 34% in 1987.

As so far described, Kenya currently faces two major socio-economic problems, i.e., the population explosion and the rapid increase of its foreign debt. Consequently, the further promotion of education is strongly suggested by the current national development plan to solve these problems.

2.2 Outline of Education

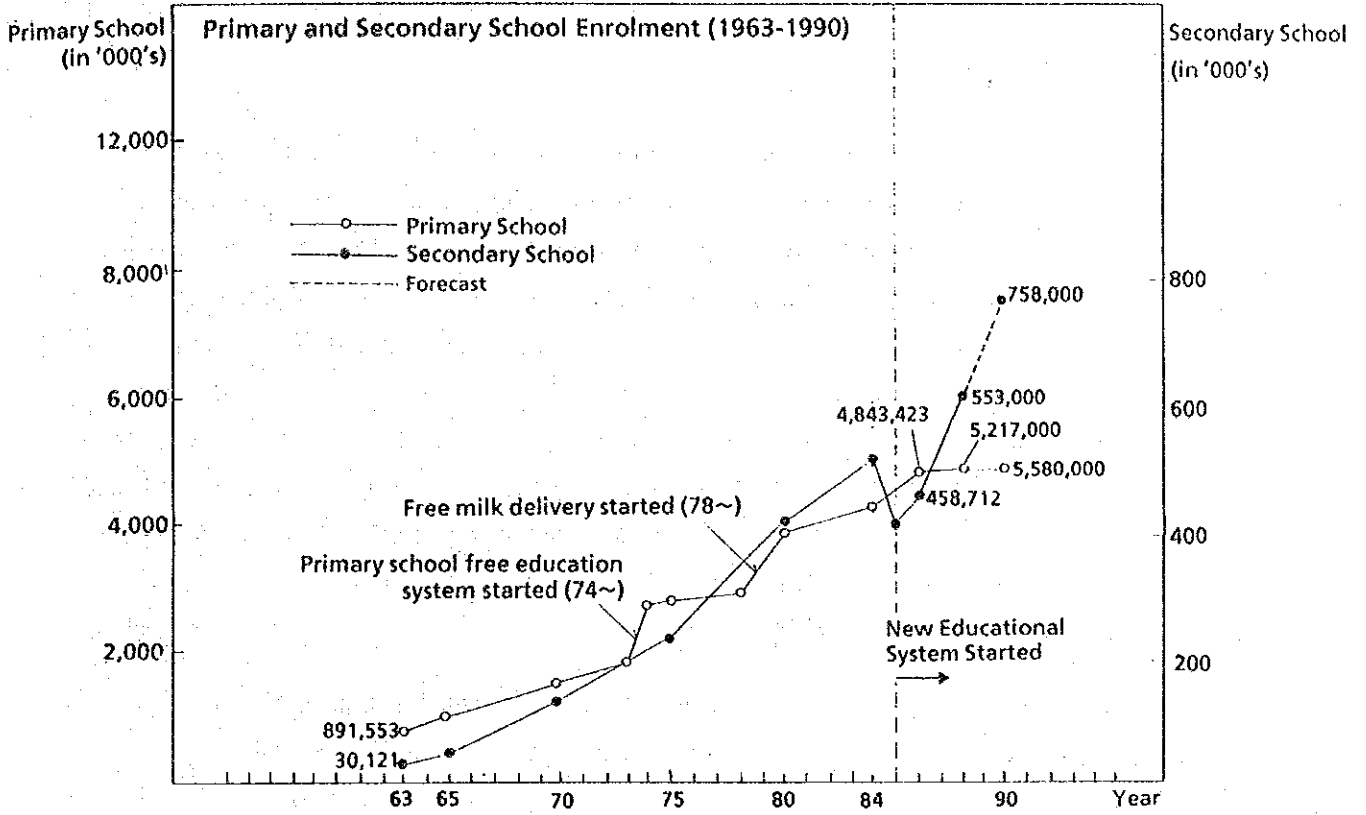
2.2.1 Educational Conditions

The rapid diffusion and expansion of education have been observed since Kenya's independence, significantly contributing to the maintenance of the peace and stability of Kenyan society. The national policy of stressing education is being firmly maintained at the present, as illustrated by the large share of the national budget which is devoted to education. The budgetary appropriation for education accounted for almost 30% of the national budget in fiscal 1988, and the fact that the school nonattendance rates for men and women in their late forties are 51% and 81% respectively compared to 18% and 38% for men and women in their early twenties indicates the Government of Kenya's stress on education.

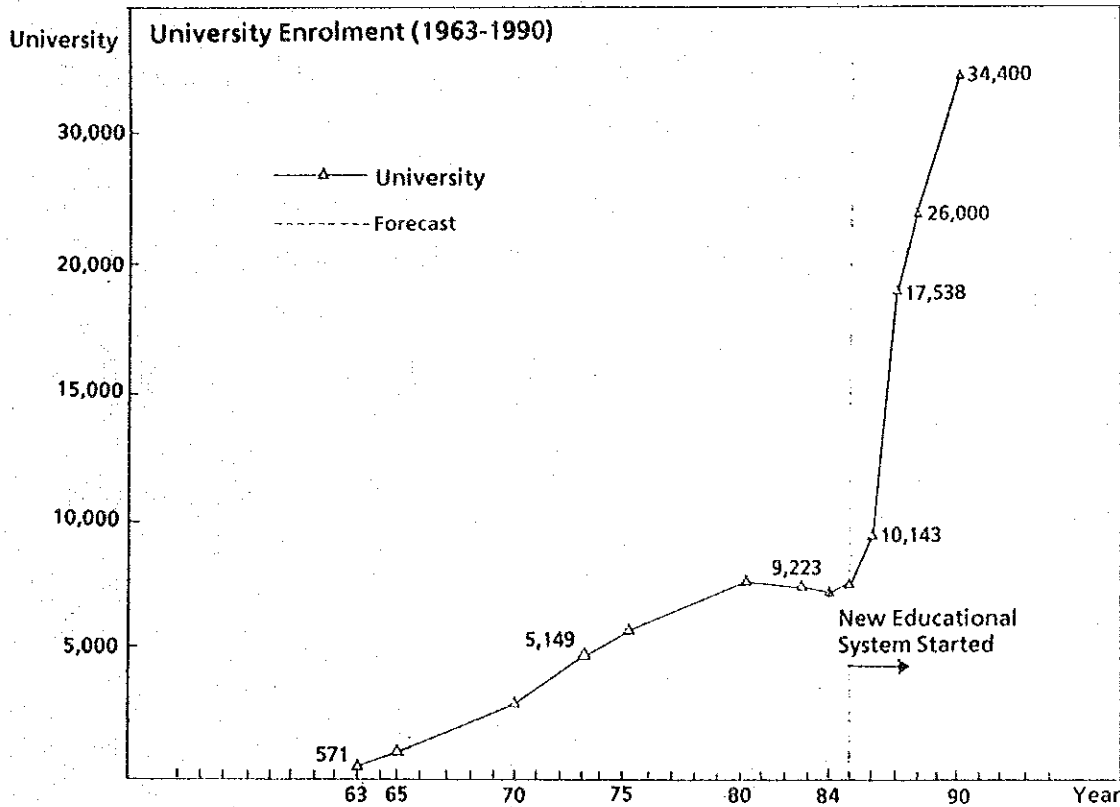
Although there is a serious dropout problem due to poverty, the number of primary school students increased from 1 million in 1964 to 4.7 million in 1984. The number of secondary school students were half a million in 1985, only 20% of the secondary school age population. The number of students undergoing higher education at colleges and universities is extremely small and only 26,000 students were enrolled in bachelor degree courses in 1988. It is, however, planned to increase the number of undergraduates to some 52,000 by 1993. The transition of the number of students in Kenya is given by the Presidential Committee Report on education and Manpower Development (March, 1988) as shown on the followings. (Refer to Fig. of Primary School, Secondary School and University Enrolment)

In response to the public demand for equal educational opportunities, the Government of Kenya has firmly staged that every Kenyan national has a right to education and is trying to foster useful manpower for national development. The Government of Kenya is also trying to promote the modernization of agriculture and industries through educational reform, thereby contributing to socio-economic development and the improvement of the standard of living in Kenya. As part of these efforts, the old 7-4-2-3 educational system was replaced by the 8-4-4 system in 1985 and technical training was emphasized as an important ingredient of education.

■ Primary School, Secondary School and University Enrolment



Source : Report of the Presidential Working Party on Education & Manpower Training Next Decade and Beyond



Source : 6th National Development Plan 1989~1993

2.2.2 New Educational System and Higher Education

(1) New Educational System

The old educational system (7-4-2-3) was introduced with the intention of separating secondary school leavers into those going on to technical training courses and those going on to higher education courses. High schools under the old system were a preparatory step to university. With the growing unemployment problems, however, the number of high school graduates entering polytechnics originally meant for secondary school leavers increased, making the status of high schools unclear. The new system (8-4-4) was introduced to clarify the situation as the old system no longer accurately reflected the reality and to allocate the former high school education period to primary and higher education to increase the educational investment effects in these two educational fields.

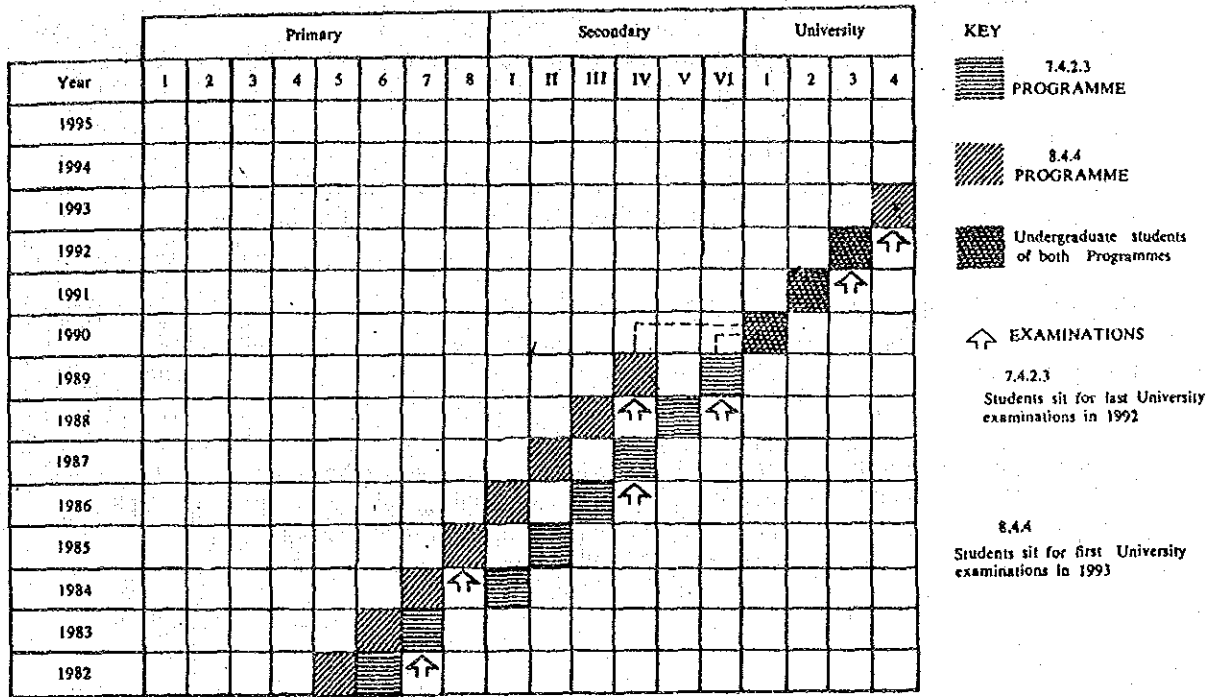
The main purpose of the new system was to foster people with a spirit of independence and a desire for national development through a strong emphasis on technical education while also aiming at the following:

- 1) Creation of employment opportunities in modern industries, small companies and self-employment fields for school leavers.
- 2) More opportunities for higher education .
- 3) Introduction of a system whereby information on employment is easily accessible to students and parents.
- 4) Establishment of the beneficiary principle to an appropriate extent in regard to the cost of education while taking the right to education for granted.

The change from the old system to the new system has been conducted as shown in the following table.

■ Progress of Pupils / Students Affected by Implementation

**MINISTRY OF EDUCATION,
8.4.4 EDUCATION PROGRAMME
PROGRESS OF PUPILS/STUDENTS AFFECTED BY IMPLEMENTATION**



(2) Higher Education

Higher education in Kenya is largely divided into two types, i.e. university education as represented by the University of Nairobi and college education at polytechnics and teacher training colleges, etc. The former is described as academic education while the latter is described as technical education. The main educational institutions in Kenya at present in these two fields are listed in the following table.

■ Higher Educational Institutions in Kenya

Name	Faculty / Department	No. of Students (1988/89)
National Universities University of Nairobi	Agriculture, Veterinary Medicine, Architecture, Design and Development, Engineering, Science, Medicine, Arts, Commerce, Law	10,714
Moi University	Science, Technology, Forest Resources & Wildlife Management, Education, Information Sciences	2,103
Kenyatta University	Education, Arts, Science	6,330
Egerton University	Arts and Social Sciences, Agriculture, Education and Human resources, Science	1,825
Jomo Kenyatta University College of Agriculture and Technology	Horticulture, Food Technology, Agricultural Engineering, Mechanical Engineering, Civil and Architectural Engineering, Electrical & Electronics Engineering	686
Main Polytechnics and Colleges		
Kenya Polytechnic	Machinery, Architecture, Electrical Engineering, Graphics, Business, Library Science, Computers	3,259
Mombasa Polytechnic	Business, Machinery, Electrical Engineering, Electronic Engineering, Architecture, Civil Engineering, Mathematics, Engineering	1,535
Eldoret Polytechnic	Surveying, Agricultural Engineering, Water Utilization, Business	(30)*
Kenya Technical Teacher Training College	Teacher Training, Industrial Courses (Machinery, Agriculture, Textile Production)	594*
Kenya Science Teacher Training College	Teacher Training in various subjects	540**

Source : Ministry of Education

* as of 1987

** as of 1983

Under the present conditions of higher education in Kenya, especially in the case of the technical departments of universities, it is impossible for students to acquire the advanced technical skills demanded by industries due to the poor laboratory facilities and the shortage of capable teachers. A similar situation prevails at the polytechnics providing OD courses where the poor laboratory facilities make it difficult for student to gain employment in highly specialized fields. As described above, the higher educational courses at both universities and colleges (polytechnics) have certain weak points and the fostering of technical manpower equipped with sound theoretical knowledge and a high level of technical skills aimed at by the Government of Kenya is urgently required.

Under the new system, the objectives of university education are defined as follows:

- 1) To develop and maintain the intellectual ability of the people, to diffuse knowledge and to continuously stimulate the intellectual life of the people.
- 2) To train and foster the high level of manpower required for nation building.
- 3) To promote the development of the Kenyan culture, to pursue ideals and to enhance social values.
- 4) To widely contribute to local communities by providing professional knowledge and technologies to solve pressing problems relating to policies under implementation.
- 5) To supplement national policies by achieving higher education development programmes.

(3) Current Conditions of Universities

Educational qualifications play a crucial role in regard to employment and salary in Kenya with the result that the number of students wishing to go on to higher education is steadily increasing. The idea of equal educational opportunities expressed as a national policy has also accelerated the increase of applicants to higher educational institutions.

The number of applicants to the for existing national universities is several times the number of places available and only some 50% of those applicants

with the right necessary qualifications are granted a place as shown in the following table.

■ Number of Students
Candidates, Qualified and Admitted to Public Universities (1986/87~1990/91)
(Person)

Year	1986/87	1987/88	1988/89	1989/90*	1990/91*
A. Nos. of Candidates Taking Certificate Examinations	17,697	41,861	30,288	33,844	33,844 (KACE) 150,000 (KCSE)
B. Nos. Qualified Passing Certificate Examinations	6,858	17,441	14,579	14,787	15,000 (KACE) 30,000 (KCSE)
C. Nos. of Students Admitted to Univ.	2,728	8,475	7,599	7,700	17,000
D. Ratio of Student No. Admitted (C/B×100)	39.78%	48.59%	52.12%	51.33%	37.7%

Source: Ministry of Education

Remark

* Estimate
(KACE) Kenya Advanced Certificate of Education
(KCSE) Kenya Certificate of Secondary Education

This low admission percentage is mainly caused by the difficulty of securing teaching staff and the expansion of facilities in a short period of time and also by the full boarding system as the dormitory capacity cannot possibly accommodate all applicants (all universities and polytechnics in Kenya adopt the full boarding system).

Those who are rejected by the universities usually go to polytechnics or teacher training colleges. In addition, some 12,000 students go abroad at present seek higher education (Source: Sixth National Development Plan 1989 - 1993). This large number of Kenyan students studying abroad means a serious outflow of precious foreign currency and is becoming a major economic problem. The Government of Kenya has consequently requested all universities to double their admissions by 1990 when the first students under the new educational system will graduate.

The transition of the number of universities and students and the future number of students indicated by the Sixth National Development Plan are as follows.

Transition of Number of University Students

	<u>1963</u>	<u>1973</u>	<u>1983</u>	<u>1986</u>	<u>1987</u>
No. of Universities	1	1	1	4	4
No. of Students	571	5,149	9,223	10,143	17,538

Estimated Number of Students

	<u>1988</u>	<u>1989</u>	<u>1990</u>	<u>1991</u>	<u>1992</u>	<u>1993</u>
Undergraduates	26,000	29,900	34,400	39,500	43,500	52,300
Graduates	1,900	2,200	2,400	2,700	3,100	3,400

The development of university education in Kenya is given below and the existing four universities are outlined.

● Development of Universities in Kenya

1956 ... Establishment of the Royal Technical College in Nairobi

1961 ... The Royal Technical College in Nairobi was renamed the University of Nairobi and became a constituent college of the University of East Africa.

1970 ... The University of Nairobi became independent from the University of East Africa to become the first Kenyan university.

1984 ... Establishment of Moi University, the second university in Kenya

1985 ... Establishment of Kenyatta University

1987 ... Establishment of Egerton University

● Outline of four Universities

University of Nairobi

Has faculties of Medicine, Veterinary Medicine, Science, Arts, Engineering, Commerce, Law, Agriculture and Architecture/Design/Development and also conducts post-graduate courses. Located on Nairobi with the main campus, Chiromo campus and Kabete campus, etc. Number of students in 1988/89 - 10,714.

Moi University

Has faculties of Science, Technology and Forest Resources/Wildlife Management, Education, Information Science, emphasizing technologies and environmental science. Located in Eldoret, northwest of Nairobi. Number of students in 1988/89 - 2,103.

Kenyatta University

Located at the site of the former base of the British Armed Forces, became the Constituent College of the Nairobi University in 1972 and became the third independent university of the country in 1985. Having the Faculties of Education, Arts, Science, etc., the number of students mounted to 6,330 in the 1988/89 terms.

Egerton University

Established in 1939 as an agricultural extension school, its main themes are agriculture and agricultural education. It has a vast 5,000ha campus in the outskirts of Nakuru. Having the Faculties of Agriculture and Science, the number of students mounted to 1,825 in the 1988/89 term.

2.2.3 The Improvement and Expansion of Jomo Kenyatta University College of Agriculture and Technology

The Jomo Kenyatta University College of Agriculture and Technology (JKUCAT), originally established as the Jomo Kenyatta College of Agriculture and Technology (JKCAT) in May 1981, provides 3-year diploma courses in the Faculty of Agriculture and 4-year technical courses in the Faculty of Engineering with the main purpose of fostering middle level engineers with appropriate expertise to contribute to the socio-economic development of Kenya.

Kenya's current socio-economic requirements in view of future development necessitate the fostering of many people with combined technical (represented by such qualifications as the Ordinary Diploma and Higher National Diploma) and academic (represented by such degrees as Bachelor of Science and Bachelor of Technology) backgrounds.

Under the present conditions of higher education in Kenya, especially those of the technical departments of universities, it is impossible for students to acquire the

technical skills demanded by industry due to the extremely poor practical training facilities. A similar situation also prevails in polytechnics where the quality of practical training is said to be questionable.

In this context, the practical training provided at JKUCAT is extremely good and approx. 90% of its students pass the national examinations, far surpassing the performance of other polytechnics. As a result, JKUCAT graduates are generally considered capable of immediately commencing technical work in their respective fields.

JKUCAT has grown with the cooperation of Japan and enjoys a very good reputation. However, in view of the fact that the salary scales for new graduates are dependent on educational qualifications, upgrading of JKUCAT to full university status has long been desired. Moreover, the desire for upgrading is strengthened by the difficulty of employing capable teaching staff at the college level due to the pay gap between universities and colleges.

The Government of Kenya revised the Kenyatta University Act, enforced it on August 16, 1988, and upgraded the original JKUCAT to a constituent college of Kenyatta University under the name of JKUCAT, showing its intention to make it the fifth full fledged university in Kenya in the near future. Upgrading of the JKUCAT to constituent university will improve the employment conditions for its graduates and the improved pay scale will attract capable teachers, further consolidating JKUCAT's reputation. The present Project differs from a simple expansion project in that JKUCAT will be able to provide graduates with a high level of academic and technical knowledge and skills by the further strengthening of its already well-known technical reputation and improvement of its academic education. Project implementation is, therefore, believed to be highly desirable.

2.3 Outline of Related Plans

2.3.1 National Development Plans

A series of national development plans has been implemented since Kenya achieved independence in 1963, adopting various development policies as described below.

The First National Development Plan (1966-1970) and Second National Development Plan (1970-1974) both stressed a quantitative expansion of Kenyan students and the fostering of the manpower required for the management of the country by Kenyans. The Third National Development Plan (1974-1978) focused on the establishment of polytechnics with stress the development of technical skills and general abilities. The Fourth National Development Plan (1979-1983) stressed the fostering of the manpower required for a new national development drive, including artisans, technicians, university graduates and experts, taking diversification and functionalization of society into consideration. As the Fourth National Development Plan did not fully achieve its targets due to the trade deficit and the increased foreign debt, the maximum utilization of domestic resources was given priority in the Fifth National Development Plan (1984-1988) and the new educational system was introduced to respond to the socio-economic requirements for practical education.

The Sixth National Development Plan (1989-1993) announced officially in March 1989. The main pillars of the Sixth National Development Plan are (i) efficient investment in highly productive projects having thoroughly reviewed the results of the Fifth National Development Plan, (ii) a rapid increase of revenues and efficient tax collection to reduce the budgetary deficit and (iii) introduction of the beneficiary principle in such fields as health and education by the adoption of the cost-sharing concept.

2.3.2 Plans Relating to Education

The Report of the Presidential Working Party on Education and Manpower Training for the Next Decade and Beyond (1988) made a wide range of suggestions for education and manpower development while evaluating the achievements of the new educational system. The contents of the Report were compiled as a government ordinance which was announced as Sessional Paper

No. 6 - 1988. The Report noted the important points of the new educational system to be as follows:

- 1) Appropriate facilities, equipment and teaching materials and qualified teaching staff are required to provide versatile and high level technical and job training.
- 2) Various arrangements, including the consistency of and harmony between the curricula and examinations with qualifications, are required at all stages of education to maintain the quality of education.
- 3) Introduction of the cost-sharing concept to supplement the budgetary appropriation for education
- 4) Introduction of compulsory primary education and infant education and eradication of illiteracy, etc., to further advance equal educational opportunities for all Kenyans.

The Report stated education in Kenya to be an essential tool for nationwide efforts to achieve economic development to support an estimated population of 35 million in the year 2000. The achievement of the target of 5.6% annual growth of the Kenyan economy and the creation of 14 million new jobs are believed necessary to achieve this goal.