

NO.

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

DEVELOPMENT OF HUMAN RESOURCES  
FOR  
THE TROPICAL FOREST MANAGEMENT  
(STRATEGY FOR THE KENYA)

NOVEMBER 1993

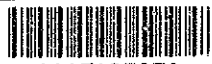
JAPAN OVERSEAS FORESTRY CONSULTANTS ASSOCIATION  
(JOFCA)

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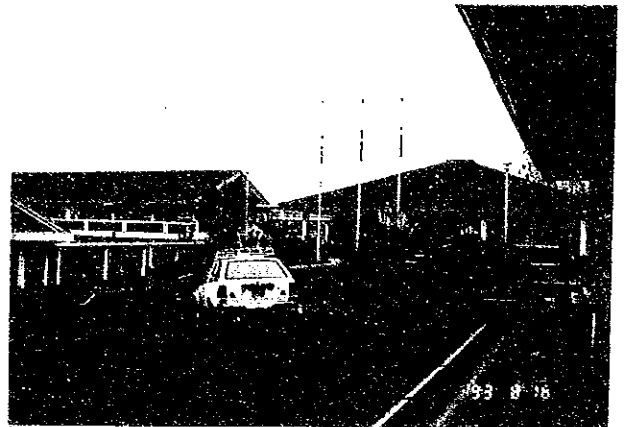
**JAPAN OVERSEAS FORESTRY CONSULTANTS ASSOCIATION  
(JOFCA)**

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27055



1. Forestry Department of Kenya Government



2. Buildings of JOCKEY Social Forestry Project



3. A nursery of JOCKEY Social Forestry Project in Kitui



4. Making planting holes for the afforestation



5. A meeting at ICRAF



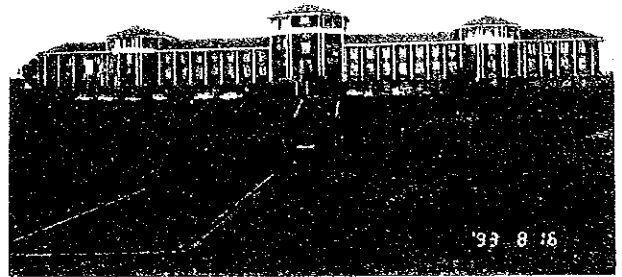
6. ICRAF Building







7. Faculty of Forestry, Moi University



8. The Headquarters building of Moi University



9. The meeting at Moi University



10. Maseno Center

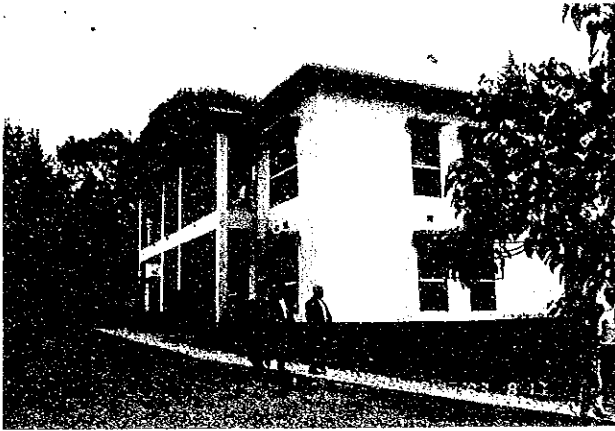


11. The nursery of Maseno Center



12. A field experiment site of Maseno Center





13. KIFCON. Office Building in Maseno near Kisumu



14. Kakamega District Forest Office



15. The Meeting at Kenya Forestry College in Londiani



16. KFC buildings of class-rooms



17. One of the New Building of KFC



18. This photo tells us the importance of joint efforts by people for the afforestation. (A near site from Erdret)



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## 1. Introduction

The current rapid decrease and deterioration of tropical forests are posing a grave threat to human beings, and the settlement of this problem has drawn world-wide attention.

Such a decrease in tropical forests has exerted a serious influence on the social economy of developing nations that depend on agriculture, livestock farming and forestry. In addition, the decrease has also become the subject of discussion relating to the whole world, and allows no time for delay in settlement to protect the global environment from the extinction of living species in tropical forests, global warming, and other difficulties.

In order to resolve the problem, diversified measures are required, and steps for the protection of forests and afforestation in developing nations are fundamental. However, it is an undeniable fact that in taking such steps, developing nations are short of local forestry officials, qualitatively and quantitatively, for forest management and afforestation.

Based on the recognition of problems mentioned above, this study aims at preparing and proposing, by nation, guidelines and methods for training tropical-forest management officials.

The study was conducted in Kenya in August, 1993.

## 2. Current Situation of Forests

The territory of Kenya extends 56.9 million ha, of which 2.2 million ha is covered with forests: gazetted forests occupy an area of 1.7 million ha, while others occupy 0.5 million ha. Thus, forests account for just about 3% of the territory.

Forests can be classified in several ways.

### Types of Gazetted Forests

Indigenous Forest	0.80 (million ha)	47.1%
Woodland	0.34	20.0
Bamboo Forest	0.15	8.8
Grassland	0.20	11.8
Mangrove	0.05	2.9
Plantation	0.16	9.4
Total	1.70	

### Statutory Classification

Gazetted Forests	1.70 (million ha)	77.3%
Ungazetted Forests	0.50	22.7
Total	2.20	

### Forest Types

Natural Forests	2.04 (million ha)	92.7%
Plantation Forests	0.16	7.3
Total	2.20	

Plantation forests are composed of the following species. (The attached figures differ somewhat from actual figures.)

Indigenous conifers		9,000 (ha)	5.7%
Indigenous hardwoods		11,000	6.9
Exotic conifers	Cypress	58,000	36.5
	Pinus	65,000	40.9
Exotic hardwoods	Timber	6,000	3.8
	Fuel	10,000	6.2
Total		159,000	100.0



### 3. National Forestry Policies

In Kenya, demand for fuel and timber has rapidly increased because of the annual increase in population by 3.4%, and has accelerated the decrease in forests, which in turn has exerted a marked effect on the environment.

The increase in population has also caused farmland to expand and vegetation of gazetted forests to be extensively destroyed. If the current condition continues, it will exert an adverse effect on the protection of wildlife in state-owned forests and parks and also lead to soil destruction and desertification.

To cope with this situation, the government intends to rehabilitate degraded forests by using forests and woodlands for various purposes in a sustainable way and enrich forest resources inherited from former generation.

The government will positively promote these measures in order to meet the rapid increase in timber demand and reduce adverse effects on people's living.

Consequently, the Forest Department has set the following goals for forestry:

- a. To provide wood resources and other multiple forest products to the Kenya population on sustained basis.
- b. To conserve water and soil resources for people, animals and agricultural purposes.
- c. To conserve and sustainably use biological biodiversity for the present and the future generations.
- d. To conserve and preserve forest resources for climatic stabilization through carbon sequestration and subsequent reduction of global warming.

#### 4. Organization of Forest Conservation and Management

##### (1) Forest Department

To attain the goals of forestry policy, the Forest Department has concentrated its administrative functions on two fields.

One of them is the management of natural forests, and the other is an forestry promotion project. Whereas the former focuses on gazetted forests, the latter also covers land other than gazetted forests. The former includes conservation and maintenance of natural forests, and also development of highly productive plantations under the control of district forest offices. The latter includes extension of forestation projects at the municipal level and maintenance and management of forestry production, which are taken on by local extension agencies. The relationship between local forestry offices and local extension agencies is coordinated by the District Forest Officer.

The current organization of the Forest Department is shown in Fig. 1. A revision of the Forest Plan has been promoted with financial and technical assistance from Finland (FINNIDA) since 1992. In the revised plan, it is noted that the organization should be simplified in order to resolve administrative issues. The main features will be outlined in Fig. 2. The revised plan seems to be very feasible.

The Forest Department in charge of forestry administration belongs to the Ministry of Forests and Environment. The Forest Research Institute is a semigovernment organization and takes the lead in research and training in social forestry under the control of the Board of Directors.

The position classification of the Department is as follows:

Professional staff	168
Technical staff	661
Technical support staff	473
Administrative support staff	663
Forest guards	2,033

Subordinate staff	13,998
Total	17,996

The required qualifications for these persons are:

Professional staff: Ph.D, M.Sc or B.Sc

Technical staff: Holding a diploma or a certificate  
in forestry

Technical support staff:

Holding a diploma or a certificate in  
non-forestry fields (including drivers and  
craftsmen)

Administrative support staff:

Qualified for clerical work or holding  
a diploma in non-forestry fields or  
a senior certificate (including clerks,  
keepers)

Forest guards: Except for the above-mentioned persons

Subordinate staff: See the above.

The chart of staff by department is shown in Table 1. In this table, the current situation is compared with the recommended situation in the proposed new plan for forests. There is no major change in the staff as a whole, but a substantial reduction in the level of subordinate staff. In the table, the numbers of provincial and district offices are eight and fifty-one, respectively.

The organization and business of the District Office that the Study Team could survey will be introduced as an example in the following.

#### Kakamega District Office

The Kakamega forest area includes rain forests which are rare in Kenya at the equator. The main work in this area is to protect natural forests within its jurisdiction.

In practice, a tea field 100 m wide is developed as a buffer to keep people from entering natural forests. (This area is famous for producing black tea, and tea fields are extensively distributed

in individually- or corporately-owned land.) For the same purpose, farmers who previously lived within the forest are completely kept away from the forest. An open space resulting from withering or stealing is filled with domestic species by the enrichment method. Technical guidance is given to farmers in planting trees on their own so that they will reduce their dependence on natural forests.

Forests in this area comprise the Kakamega Forest, occupying an area of 23,777 ha, of which 19,729 ha including 12,700 ha of natural forests is under the control of the Forest Department. The remaining area is managed by the Kenyan Wildlife Society.

The following staff are assigned to this department.

District Forest Officer	1	bachelor
Assistant District Forest Officer	1	bachelor
Foresters	13	bachelors
Forest Assistants	11	certificate holders
Forest Guards	60	certificate holders or trained persons.

In this area, KIFCON is an international organization (mentioned later) which carries out an extension program mainly for farmers in order to protect natural forests, and their activities are supported by the District Office.

(2) Kenya Forestry Research Institute

In Kenya, systematic forestry research was launched in 1934 when the government selected officers responsible for research in forestation and utilization. In 1948, the East African Agricultural & Forestry Research Organization (EAAFRO) was founded, and its headquarters was built in Muguga (present location). When researchers left the country after independence in 1963, the research activities were suspended for a while, but the organization was able to resume the research in a short time.

In 1973, the Administrative Committee for Forestry Research was set up in the Forest Department and embarked on research activities in

silviculture, forest pathology, insects and forest utilization. They achieved excellent research results by 1977 when the fore-mentioned EAAFRO was separated from the Committee. In 1981, the Forestry Research Division was set up in the Department, and twelve researchers began to study tree breeding, forest ecology and pathology, insects and timber utilization. In 1986, however, the division was released from the direct control of the Forestry Department and transformed into a semigovernment research institute managed by the Board of Directors under the Ministry of Research, Science & Technology (Fig. 3).

The purpose of this institute is to develop technologies for effective and sensible development of forests, sustainable production and management of natural forest resources. Their research area ranges from villages, tree species, trees to the careful study of methods for acquiring fundamental scientific skills required for development of forests.

The main elements are:

- a. Research in silviculture and forest environments: agroforestry, forestry in arid areas, plantation, breeding, forest ecology, basin management, etc.
- b. Research in forest protection and maintenance: surveys of diseases and damage by insects, entomology, zoology, control techniques, administrative techniques to prevent damage by living organisms, forest soil and engineering, social economy, forestry policy, biometrics, information management, etc.
- c. Research on forest products and timber: harvesting, use and marketing.

The classification of the staff and their qualifications are shown below:

	Qualification	Number
Chief Research Officer	Doctor or master	2
Principal R. O.	Doctor or master	6
Senior R. O.	Master	12
Research Officer	Master	36

Assistant R. O.	Bachelor	41
Biometrician	Master	1
Training Officer	Bachelor	8
Planner	Bachelor	2
Information & Liaison Officer	Bachelor	1

Diploma holders are assigned to local experimental sites.

This institute classifies areas according to ecological variation, and locates National Forestry Research Centers, Regional Forestry Research Centers and Satellite Research Centers in seven, eight and five places, respectively in order of importance (Fig. 4).

Of the above-mentioned local regional centers, major centers are shown in Table 2 along with their addresses and research items.

The ongoing Social Forestry Training Project in cooperation with JICA is overseen by this institute.

During this study, the Study Team visited the Agroforestry Research Center in Maseno shown in Fig. 4 and Table 2. In the following, the Center will be introduced as an example of local research centers affiliated to this institute.

#### Maseno Agroforestry Research Center

This center is located in Maseno near Lake Victoria in the western part of Kenya.

The center is designed to study agroforestry in highland forest areas with high rainfall. It depends on foreign and international organizations for most of its research funds. It has now a plan to expand and improve its facilities, and expects assistance from overseas.

The following three research projects exist:

- 1) On-station research
- 2) On-farm research
- 3) Multi-purpose tree processing research

The center has received financial assistance for 1) from USAID since 1987, for 2) from the Rockefeller Foundation since 1990, and for 3) from Germany (GTZ) since 1988.

The center is a member of the Agroforestry Research Network for Africa, which was established by ICRAF (International Agroforestry Research Center) to link Zambia, Uganda, Burundi and Kenya to one another. The network covers agroforestry researches in areas whose rainfall is more than 1,500 mm per year and which are situated at an altitude of over 1,000 m.

The staff of this center are composed of five forest researchers, one agricultural researcher, and three ICRAF members. ICRAF has continued to provide assistance to the center on a regular basis.

The staff comprise:

Research Officers	9 (including the head)
Technical Officers	15
Assistants	20
Clerks	15

Research officers including the head of this center are all master or bachelors. Technical officers hold diplomas or have received equivalent training. Assistants have received training to help researchers.

Agroforestry extension activities are actually carried out by members of non-government organizations visiting farms.

Since public relations are important for the execution of agroforestry, the following routines are carried out in addition to research activities.

- 1) Publicity through mass media
- 2) Seminars and workshops for extension staff
- 3) Awareness by farmers of set dates
- 4) Agricultural festivals and commendations

- 5) Biannual publication of newsletters to provide information to extension staff.

Thus, the Maseno Research Center serves as a center of agroforestry research among forestry research institutes. A member of the Japan Overseas Cooperation Volunteers Team is assigned to this center and mainly engaged in extension activities.



Table 1 Summary Table of Present Staff and Optimum Requirements

No.	Function	Subordinate staff (SS)		Forest guards (V)		Adm. support staff (AS)		Techn. support staff (TS)		Technical Staff (T)		Professional staff (P)		TOTAL	
		Opt.	Pres.	Opt. <sup>2)</sup>	Pres.	Opt.	Pres.	Opt.	Pres.	Opt.	Pres.	Opt.	Pres.	Opt.	Pres.
1	Districts														
	- Forest Stations	5788	10200	2180		480		720		480				9648	
	- Extension Division	4206	3255	203		470		470		235				5584	
	- District Offices	235				235		188		47		94		799	
	- District Subtotal	10229	13455	2383	2016	1185	492	1378	354	762	595	94	72	16031	16984
2	Provinces														
	- Subtotal	40	28	0	0	56	58	16	0	0	5	24	9	136	100
3	HQ, FITC, KFC, RCU <sup>3)</sup>														
	- Total	515	515	17	17	113	113	119	119	61	61	87	87	912	912
	TOTAL	10784	13998	2400	2033	1354	633	1513	473	823	661	205	168	17079	17996

1) Subordinate staff of the District Offices is included in the present figures of the Forest Stations and Extension Divisions.

2) In the category of Forest Guards, the present establishment has been used as optimum for the time being. In sharing for the Forest Stations and Extension Divisions the present shares by votes 1734:162 is used.

3) For HQ, FITC, KFC and RCU the present number of staff is regarded as optimal until detailed analysis has been carried out on the future role and organization of these institutions.

Table 2 KEFRI Headquarters and Local Centres

Centre	Ecological zone	Research Programmes/ Activities
KEFRI Headquarters	Country wide	Leadership, planning and coordination of all research programmes.
Muguga National Research Centre	High potential areas East of the Rift Valley	Planning of all research programmes in silviculture, tree improvement, forest ecology, agroforestry, forest pathology, entomology, economics and other support programmes.  Tree Seed Technology Implementation of Programmes on highlands East of the Rift Valley.
Karura National Research Centre	Country wide	Planning, implementation and coordination of research programmes in forest products.
Londiani	High potential areas on highlands West of the Rift Valley	Silvicultural and tree improvement research for highlands species.  Tree seed production.  Research activities in pathology, entomology.
Turbo	High potential areas	Silviculture and tree improvement of pulpwood species.  Pathology and Entomology Research.  Has seed collection sub-centres at Kakamega and Kitale.
Gede	Medium potential Coastal lowlands	Silviculture and tree Improvement for Coastal lowlands.  Seed production centre

Centre	Ecological zone	Research Programmes/ Activities
		Ecological research on lowland forests.
		Pathology and entomology research activities.
Kibwezi	Semi-arid areas	Silviculture and tree improvement research.
		Seed production and Agroforestry Research.
Bura	Semi-arid	Silviculture and tree improvement for drylands. Irrigated forestry research.
		Research on management of riverine forests along River Tana.
Hola	Semi-arid	Ecological studies of woody vegetation in semi-arid areas.
Turkana	Arid	Silviculture and tree improvement for arid zones.
		Ecological studies of arid land woody vegetation. Research on fodder trees/shrubs.
		Social forestry research.
		Agroforestry under irrigated conditions.
Maseno	Highland bimodal rainfall, maize-bean system.	Agroforestry research.
Ramogi	Semi-arid to medium potential	Silviculture and tree improvement for difficult hilly sites, particularly for farm forestry systems.
		Agro-social forestry research for lake region.

Fig. 1 Organization Chart of Forestry Department

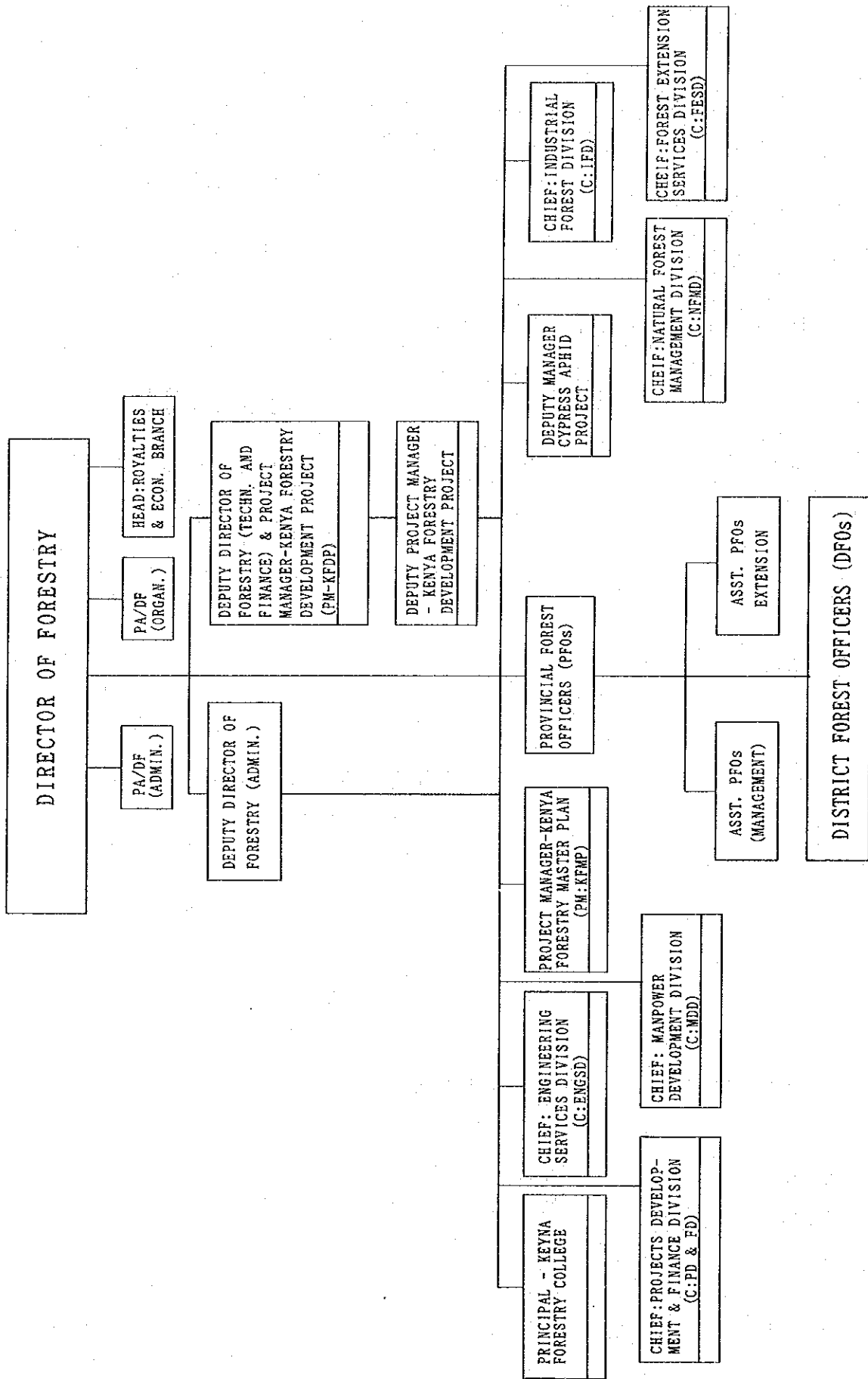


Fig. 2 The Proposed Organization Chart of Forestry Department

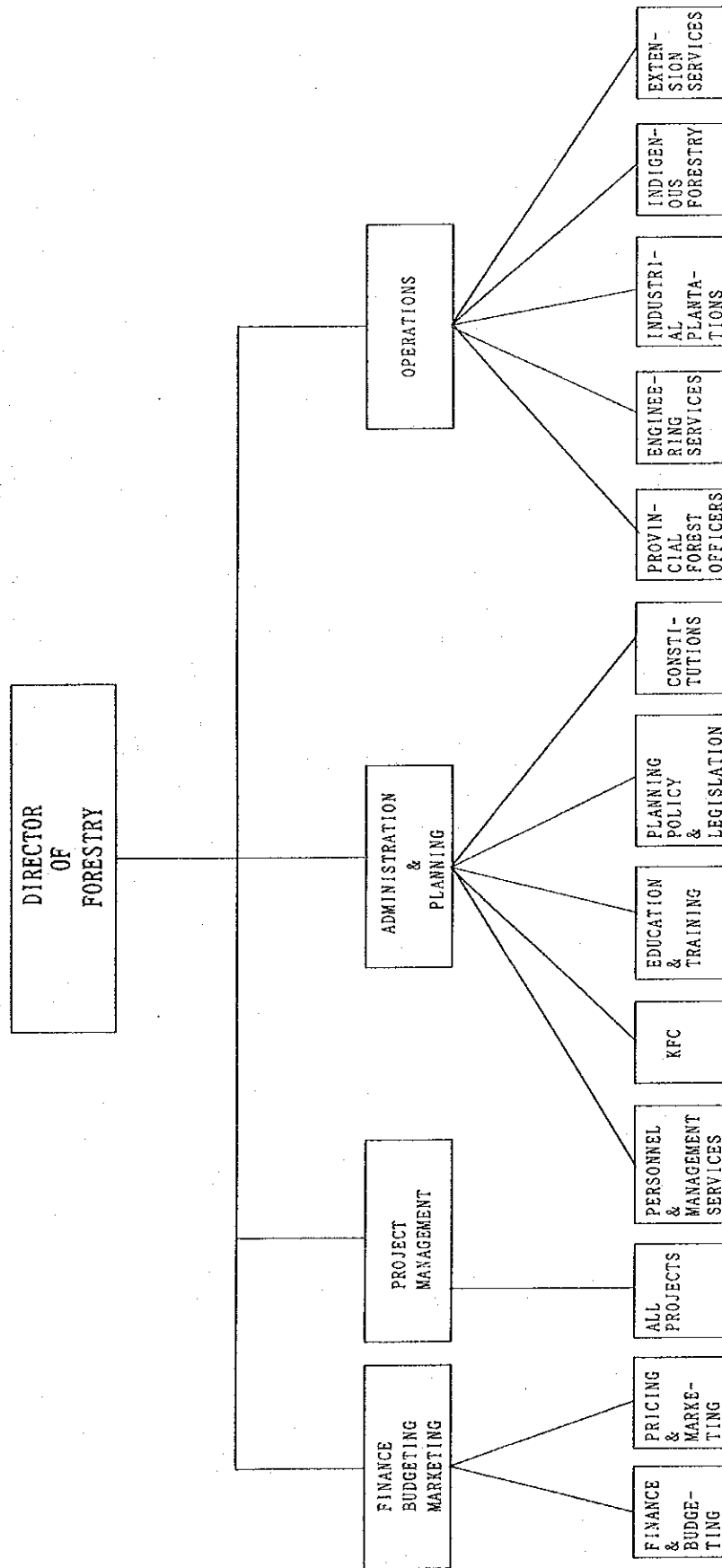
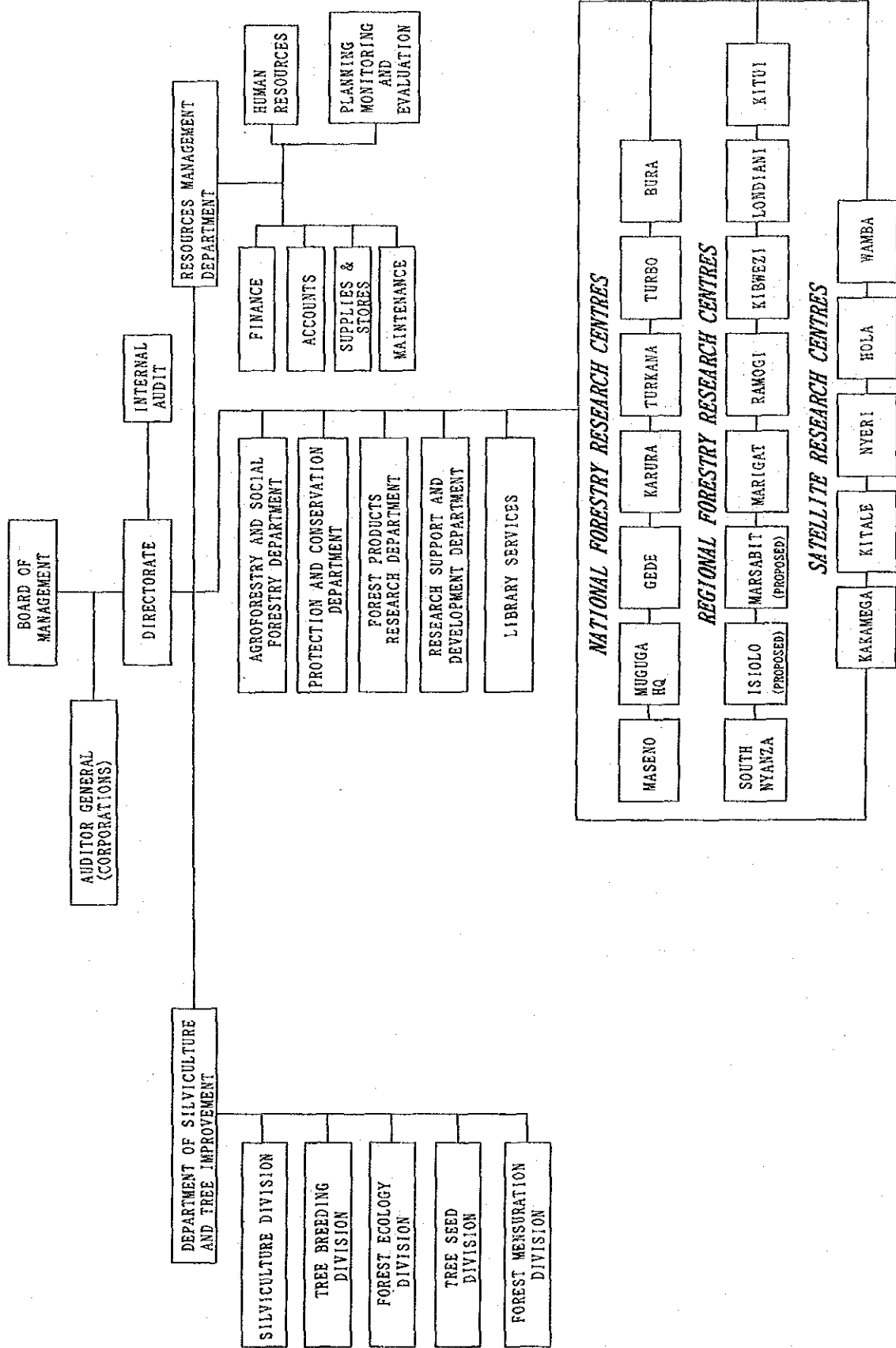


Fig. 3 KEFRI's Organization Chart



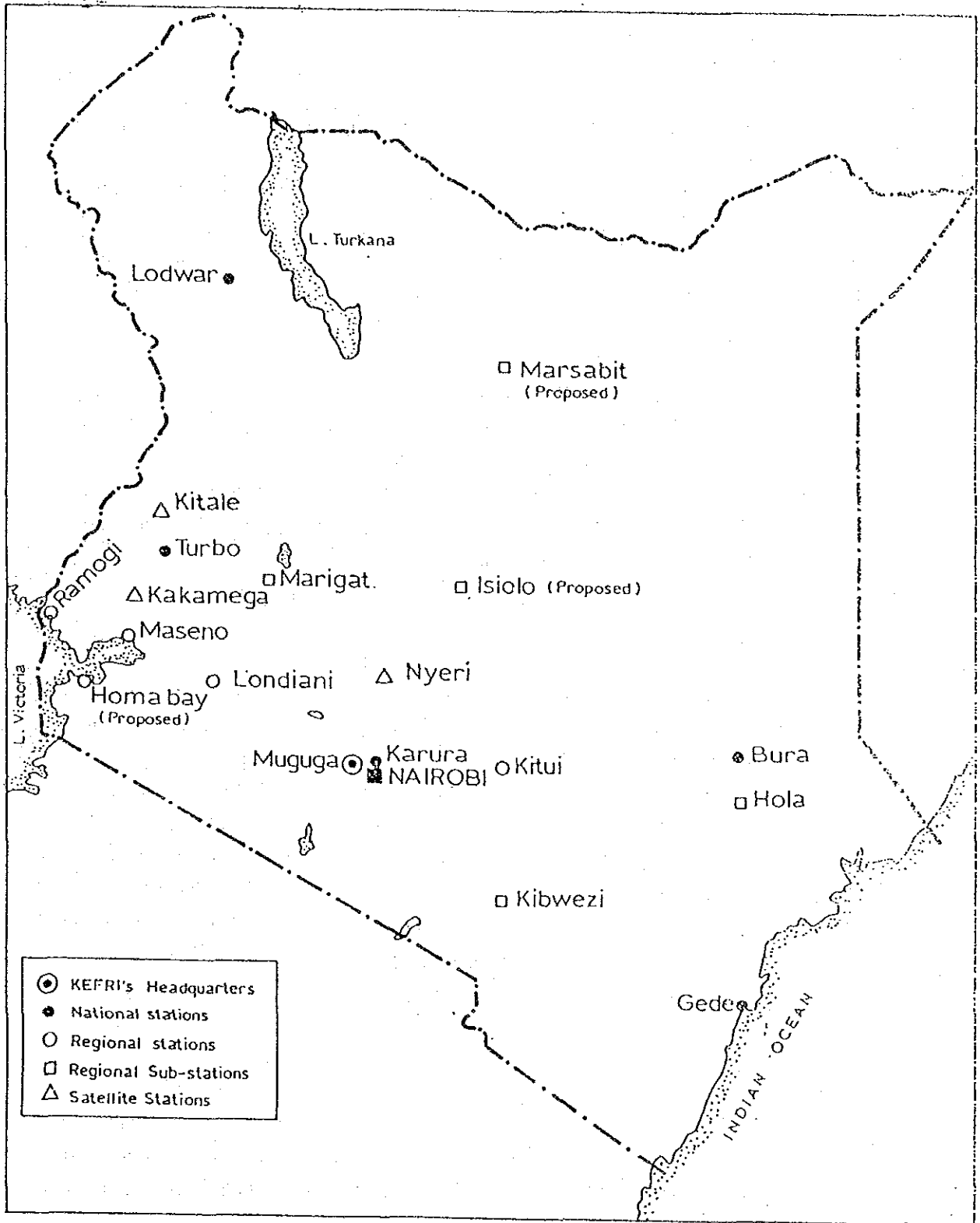


Fig. 4 Distribution of KEFRI's Research Stations

## 5. Forestry Education

### (1) University Education

First of all, the educational system of Kenya will be described.

Kenya adopted the 8-4-4 system in 1991. This system consists of:

Primary School	8 years: graduates called Standard 8
Secondary School	4 years: graduates called Form 4
University	4 years.

Secondary school graduates who have achieved the required standard are allowed to enter universities. In forest-related fields, those who have graduated from forestry schools to obtain diplomas after graduation from secondary schools are also allowed to enter universities if their school records are good enough or they have at least two years of job experience.

#### Moi University

In Kenya, formal education and training in forestry was launched in 1957 at Kenya Forestry College (mentioned later) in Londiani and placed under the supervision of the Forest Department, the Ministry of Natural Resources. Egerton College opened a three-year diploma course from 1963 to 1968 and again from 1982 to 1986 after its suspension. In 1982, another diploma course was opened in Londiani. Higher education in forestry started in 1977 when the University of Nairobi set up the Department of Forestry in the Faculty of Agriculture. The Department was moved to Eldoret (present location) in 1984 and is affiliated to Moi University. At present, it has a graduate school.

Egerton College currently awards bachelorships to graduates in the three fields of forestry, wildlife and range management relevant to natural resources. This college is now an important source of manpower in forest-related divisions of the government along with the Kenya Forestry College.



In 1987, the Department of Wood Science & Technology was set up separately from the Department of Forestry at Moi University and now supplies manpower to the timber industries.

In the following, university education in forestry will be discussed by referring to Moi University which provides the most substantial education.

The number of freshmen by faculty is shown in Table 3, and comparisons of the staff with three other universities are shown in Table 4. Moreover, the number of foreign instructors is shown in Table 5 and the assignment of curricula to undergraduates and graduates is shown in Table 6. Graduate school programs by faculty, major subject and grades are also shown in Table 7.

The Department of Forestry separated from the headquarters belonging to the Faculty of Forest Resources & Wildlife Management in Chepkoilel.

There are currently 34 freshmen, 28 second-year students and 39 third-year students. There are no seniors because the above-mentioned 8-4-4 system was adopted.

The instructors of the Department of Forestry at Moi University comprise:

Full professor	vacant (1)
Assistant professors	3
Senior lecturers	2
Lecturers	10
Tutorial fellows	9
Part-time lectures	2

All instructors are required to have already obtained or immediately obtain a doctorate. One of the senior lecturers now assumes the role of head of department.

The Department of Forestry has a close relationships with counterparts at Toronto University in Canada and Oxford University in the United Kingdom. Some instructors have studied or are now

studying at these universities. Joint projects amongst them are also under way.

Previously, all graduates were employed by the Forestry Department. Recently, however, the number of employed graduates has been rapidly decreasing as shown in the Table 8. There is concern about future trends in their employment.

A plan for forests is now being developed in cooperation with Finland (FINNIDA), and in this process university education should be carefully considered.

Another question is that the range of subjects covered by the Department of Forestry is probably too wide to educate students fully. It is proposed that the present system in the Department be divided into the following departments.

- 1) Forest biology and silviculture
- 2) Forest resources management
- 3) Agroforestry, social forestry and extension
- 4) Forest engineering and harvesting

The Department of Wood Science and Technology has already been separated from the Department of Forestry. There is a possibility that five forestry-related departments will eventually function separately.

## (2) College Education

Under the above-mentioned 8-4-4 system, a vocational course exists in addition to the academic course from primary to university education.

Secondary school graduates who have achieved excellent performance will go on to the final stage of education or university and average graduates will enter three-year special schools such as the Kenya Forestry College. Those who cannot do the above will take a two-year certificate course at special schools. If they pass an examination after graduation, they will be allowed to take a diploma course. In this case, they will complete the course in one

year.

The diploma course usually takes the form of in-service training and accepts employees of the Forest Department and private companies at the cost of their employers. Non-government organizations also bear training costs.

The in-service training system for qualitative improvement of staff is an excellent method for securing technicians.

The Kenya Forestry College (KFC), which was founded in 1957, is located in Londiani and is the oldest forestry educational institution in Kenya. This college is directly supervised by the Forestry Department.

It has the following education goals.

- 1) To train practical foresters (diploma course) and assistants (certificate course);
- 2) To provide in-service training to foresters and assistants;
- 3) To train forest guards needed by the Forestry Department and other agencies; and
- 4) To open a short-term training course in forestry.

Currently, fifteen instructors give lessons in five departments. The organization of the college is shown in Fig. 5.

The instructors in the five departments of Basic Science, Social Forestry, Silviculture & Protection, Forest Engineering and Forest Management give lessons in the subjects shown in the figure. It is notable that the number of subjects exceeds that of instructors.

At the Kenya Forestry College many short-term courses are scheduled in addition to long-term diploma and certificate courses. Judging from the number of instructors and the capacity of facilities, this college appears to be running under hard conditions.

In addition to the above-mentioned instructors, four foreign instructors also take part in teaching, i.e. two experts from Germany (GTZ) and two members of the U.S. Peace Corps.

The qualifications which these instructors hold are shown below with the number of persons.

	Qualification	Number
Principal	Master	1
Deputy Principal	Master	1
Head	Bachelor	4
Lecturer	Master	1
	Bachelor	3
	Diploma	7
Lecturer on sabattical	Bachelor	2
	Diploma	2

The campus is now being drastically improved with assistance from Germany (GTZ). When this improvement is completed, the college will be renewed with classrooms, laboratories, a faculty room, a student dormitory, staff housing, and a library. There is a college forest and a nursery for exercises which occupy an area of 4,000 ha near this college.

The certificate course provides pre-service training and the diploma course provides in-service training. The latter is not open every year.

As a rule, the certificate course accepts 60 students, but the number fluctuates markedly under various circumstances. If a certificate holder desires to enter the diploma course to receive in-service training, he is required to have at least three years job experience.

### (3) Social Forestry Training Project

This project entered Phase I in 1987 in cooperation with JICA and is now Phase II.

This project belongs to the Kenya Forestry Research Institute whose

This project belongs to the Kenya Forestry Research Institute whose director is responsible for it. It consists of training in Muguga and Kitui with a pilot forest in Kitui. Japanese experts (long-term) take part in this project, and short-term experts are also dispatched whenever required to overcome specific problems.

The relation with the supervising organization and the structure of the organization are shown in Fig. 6. The structure of this project and specific activities are summarized in Fig. 7. Training on national and regional levels is carried out in Muguga and Kitui, respectively. Pilot forestry is carried out in Kitui.

The arrangement of staff in these centers is shown below with their qualifications.

#### Muguga

Principal Research Officer	Master	1
Research Officer (Training Manager)	Master	1
Training Officer	Bachelor	4

#### Kitui

Research Officer (Project Manager)	Master	1
Training Manager	Master	1
Training Officer	Bachelor	1
"	Diploma holder	1
Forester	Diploma holder	1

The staff of the pilot forest comprise:

Pilot Forest Manager	Bachelor	1
Silvicultural Officer	Bachelor	1, Diploma 1
Officer	Diploma	1

The arrangement of the above-mentioned staff and assistants is summarized in the following table:

	Total	General Admin.	Nursery	Foresta- tion	Extension	Others
Project Manager	1	1				
Pilot Forest Manager	1	1				
Silvicultural Officer	3		1	1	1	
Technician	7		2	2	3	
Plant Operator	2			2		
Support	9		3	4	2	
Security	5					5
<b>Total</b>	<b>28</b>	<b>2</b>	<b>6</b>	<b>9</b>	<b>6</b>	<b>5</b>

It has already been several years since the start of this project, and people have deepened their understanding of social forestry training and gradually recognized its necessity in Kenya. Thus, this project has attracted more and more attention. This project will take a long time to become known well across the country because it involves unattractive forestry. However, it is worth reporting that there have been lots of inquiries concerning participation in social forestry training throughout the country.

Table 3 Number of Students by Faculty, Moi University

<u>Faculty</u>	<u>1992/93 First Year Undergraduate Enrollment</u>	
1. Education	617	
2. Social cultural & development studies	254	
3. Technology	98	
4. Information sciences	55	
5. Health sciences	46	
6. Science	104	
7. Forestry & Wildlife Management	245	
	<u>TOTAL</u>	<u>1419</u>
	Science based	548      38.5%
	Arts based	871      61.5%

Table 4 Distribution of Senior Teaching Staff in Kenya's Four Public Universities

	Moi University	Kenyatta University	Egerton University	University of Nairobi
Professors	26	18	9	80
Assoc. Prof.	43	14	26	113
Snr. Lect.	58	96	46	400
Lect.	246	330	220	606
TOTAL	373	458	301	1199

Table 5 Comparative Table between Kenyan and Non-Kenyan Members of Academic Staff (Professors) As of June 1992

	Moi University	Kenyans	Non-Kenyans	% of Expatriates over locals
Professors	26	12	14	53
Assoc. Prof.	42	21	21	50
TOTAL	68	33	35	51

Table 6 Summary of Distribution of Degree Programmes Currently being Offered at Moi University, 1992/93

	Undergraduates	Postgraduates		Total
		M. Phil.	D. Phil.	
Science based programmes (21)	1989	39	16	2044
Arts based (2 programmes)	4505	94	25	4624
TOTAL	6494	133	41	6668
		174		

Source: Moi University Calendar 1992/93



Table 7 Programmes of Post-graduate Courses

Faculty/School	Departments	M. Phil.		D. Phil.		
		I	II	I	II	III
SCIENCE	Mathematics	2	2	1	1	1
	Zoology	5	4	1	1	1
	Botany	5	-	-	1	-
FOREST RESOURCES AND WILDLIFE MANAGEMENT	Wildlife Management	6	-	1	-	-
	Forestry	5	2	2	-	-
EDUCATION	Ed. Foundations	3	2	-	-	-
	Ed. Psychology	5	2	-	1	1
	Ed. Adm. Pl. & Cur. Dev.	3	2	-	-	1
	Ed. Comm. Technology	-	-	1	-	-
SOCIAL, CULTURAL AND DEVELOPMENT STUDIES	History	3	2	1	-	-
	Geography	4	2	-	-	-
	Kiswahili	3	6	2	1	-
	English	4	5	1	2	-
	Literature	3	5	-	-	-
	Religion	2	2	-	-	-
	Philosophy	2	-	-	-	-
ENVIRONMENTAL STUDIES	Biological Sciences	5	2			
	Physical Sciences	-	3			
	Human Ecology	2	-			
	Environmental Planning	3	-			
	Environmental Health	3	1			
	Environmental Economics	-	3			
	Environmental Monitoring and Cartography	1	-			
TOTAL		69	45	10	7	4

Table 8 Number of Graduated Students from Moi University,  
Department of Forestry from 1984 to 1992

Year of Graduation	Number of Students	Number Employed After Graduation
1985	20	20
1986	24	24
1987	38	38
1988	34	34
1989	37	37
1990	80	20*
1991	45	15*
1992	65	12*

\* indicates an estimated number.

Fig. 5 Organization of the College

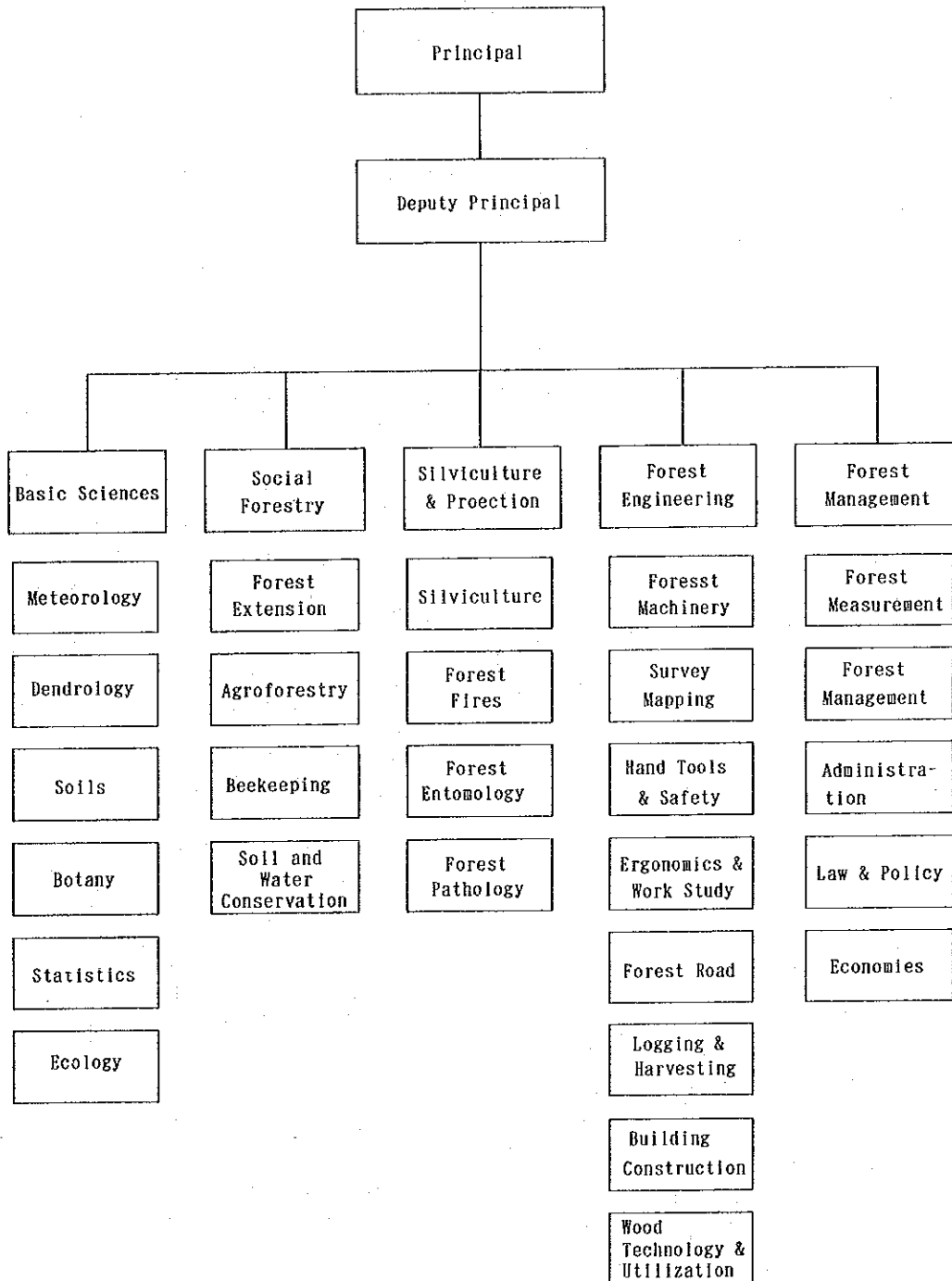


Fig. 6 Kenya Social Forestry Training Project

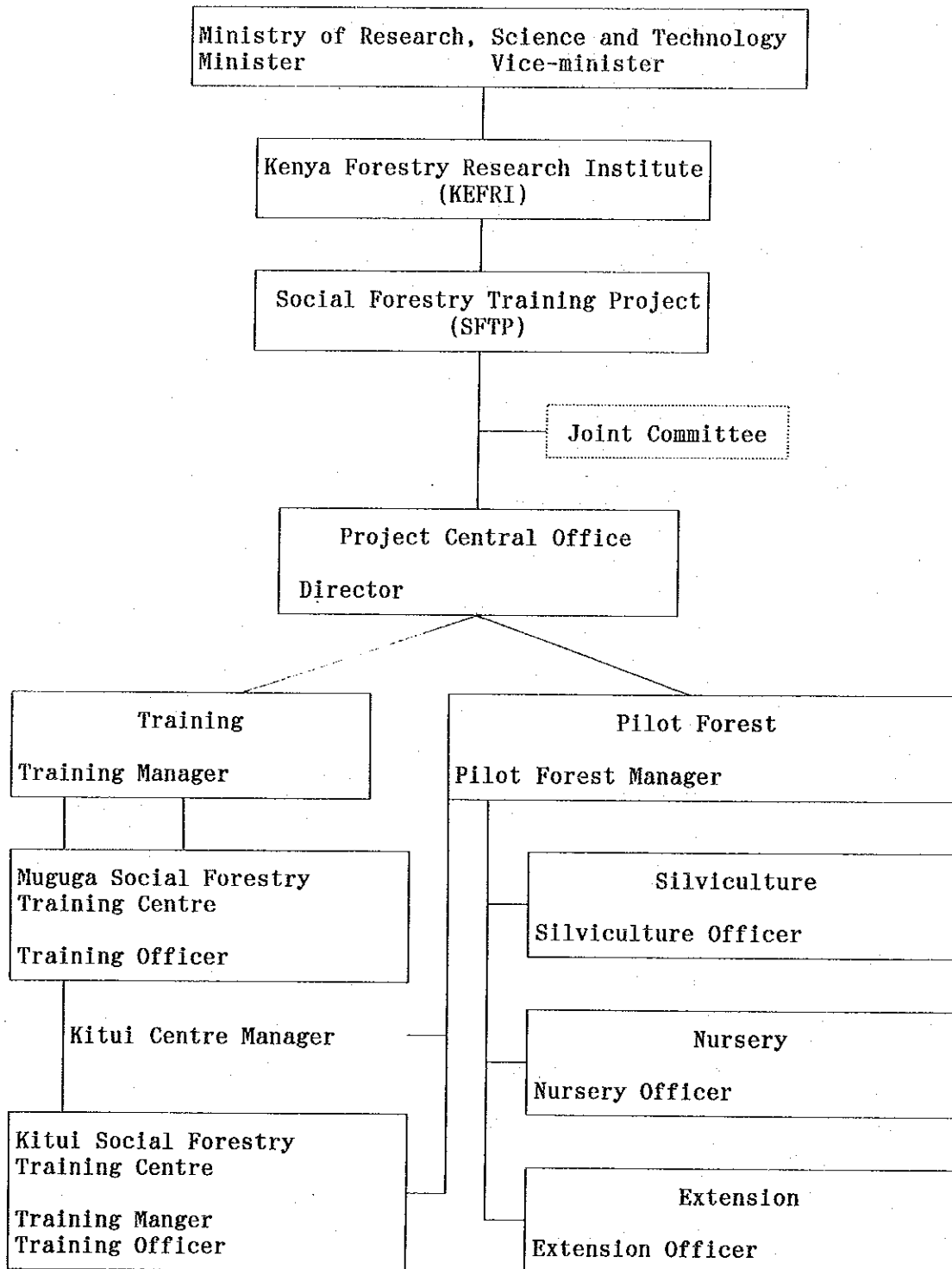
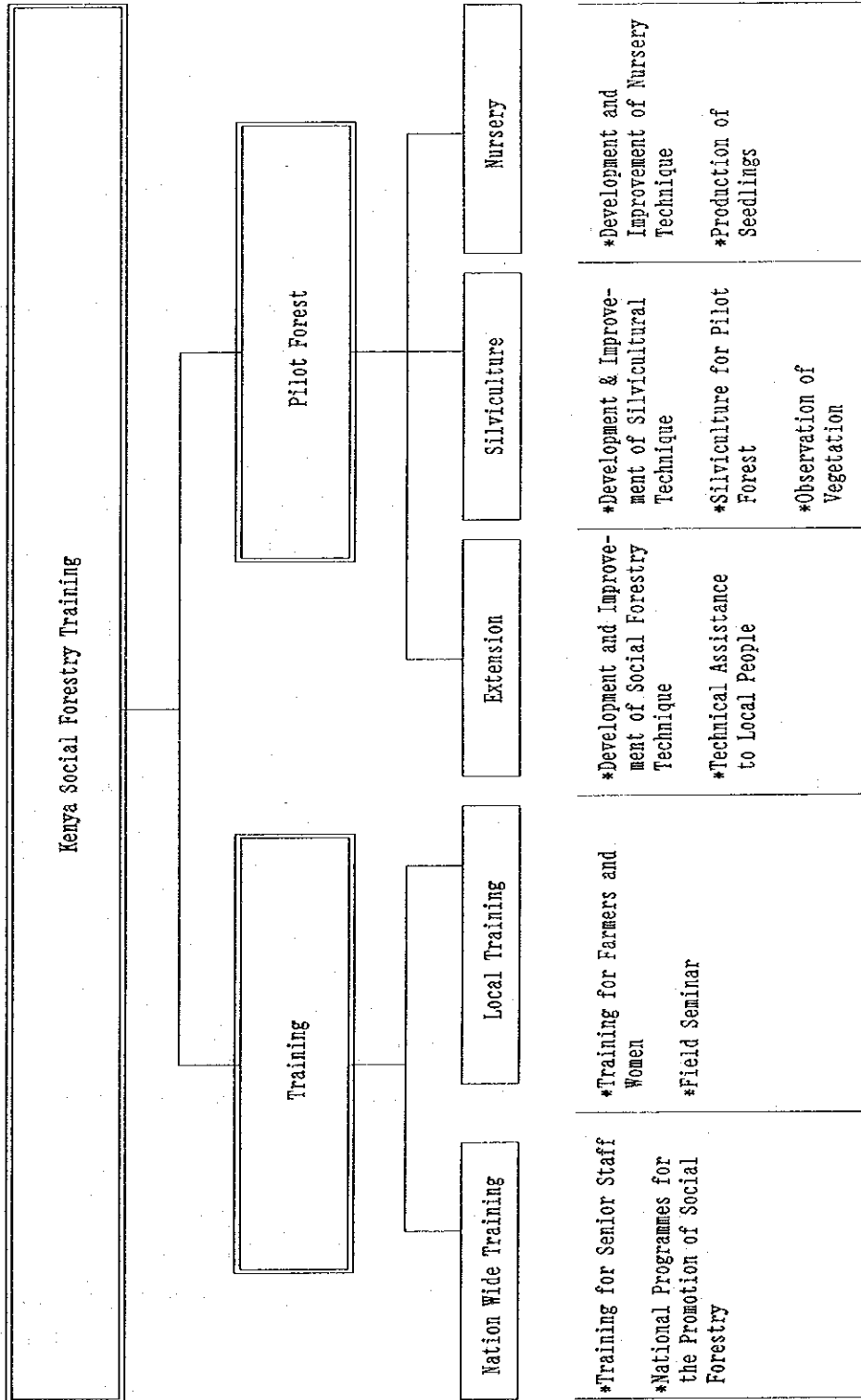


Fig. 7 The Format of Kenya Social Forestry Project



## 6. Proposals

### (1) Basic Circumstances

#### 1) Topography and Climate

The territory of Kenya extends approximately 590,000 km<sup>2</sup>, about 1.6 times that of Japan.

Kenya is situated on the equator, gradually rising from the coastal lowland facing the Indian Ocean in the east and with the eastern African plateau extending in the mid-western area. This plateau is composed of 1000 m to 2500 m elevations and a suitable area for industrial activity owing to relatively high precipitation and relatively low temperature.

The northern and eastern parts of Kenya are extensively occupied by arid and semiarid areas at an altitude of 1000 m or lower, providing harsh conditions for industrial activity.

The coastal lowland in the southeast under the tropical humid to subhumid climate is a narrow plain extending 15 to 60 km and occupies just a small part of the territory.

Important areas for environmental conservation, agricultural development, forest protection and sustainable forestry are the above-mentioned eastern African plateau 1000 m or more above sea level and the tropical coastal lowland.

#### 2) Finance

Like neighboring countries, Kenya also faces extremely stringent finance, which forces all costs to be curtailed or suspended and stagnates government projects.

Forestry education and training is also reduced or suspended. Administrative reforms are now promoted under the plan for efficient administration with the present government staff. Accordingly, the government adopts a policy for reducing the employment of recruits.

It is observed that people sporadically leave the present office and even those who remain cannot be active due to a lack of budget. An urgently needed measure is probably to establish a system to enable the remaining employees to perform their duties efficiently.

### 3) Land Ownership

Land is owned publicly or commonly in many developing countries. There are, however, numerous cases of the tragedy of the common. If domestic animals graze on commonly-owned land, the place will be subsequently burnt for future grazing. Even though the place can fortunately avoid being grazed, if bushes grow there, people will enter the bushes one after another to collect firewood. In such an area, personal or corporate forestation cannot be expected. It is common that land is devastated and transformed into a desert. This is the tragedy of the common. Similar cases are common on state-owned or publicly-owned lands. It is often found in some countries that such a situation will cumulatively expand to a marked extent.

In Kenya, land owned in common is generally controlled by people grazing cattle, who burn the pasture to exterminate harmful insects from time to time and manage it to grow young grass. Burning may often get out of control and spread to neighboring areas.

In some parts of Kenya, Tanzania or Indonesia where forestation is successfully managed, the exclusive use of land has been completely implemented.

It is prerequisite for forestation that the exclusive use of land by private or communal sector should be thoroughly implemented.

#### 4) Farmer Forestation

Farmers in Kenya have a certain style of using land in the following order of priority.

- i. Growing grains and vegetables
- ii. Practicing livestock farming
- iii. Planting trees.

They may be reluctant to carry out agroforestry unless it takes the form of coexistence with the growing of grain, vegetables and practicing livestock farming. Therefore, it is frequently seen that trees are planted around houses and along the farmland boundary.

It is said that farmers have much spare time in an off season, and do not feel it an inconvenience to travel 10 to 15 km to gather firewood.

#### 5) Forest Area in Kenya

The forest area in Kenya is some 2.2 million ha, accounting for 3% of the territory. These figures are so low that Kenya seems to have only a small area of forests and most of the territory seems to be covered with savannas or deserts.

In fact, however, nearly half the territory is covered with trees, including bushlands, a mixture of farmland and forest land, and forest areas.

It is true that Kenya experiences severe climatic conditions and the pressure of increasing population. If the present situation continues, it is a fact that the country may face a serious situation in the near future. However, it is also fact that agroforestry-like production is well managed in many areas 1000 m or more above sea level.

The above-mentioned figure of 3% indicates only the area of state-owned forests. State-owned forests are as follows:



#### State-owned Forests:

Gazetted	1.70 million ha
Ungazetted	0.50
Total	2.20

As shown in the map of forest distribution on the last page, Fig. 8, ungazetted forests are mostly concentrated on semiarid areas in the east, and judging from the climate, savanna or lower-grade forests are distributed there. Most of the gazetted forests, on the other hand, are distributed at altitudes of 1000 to 3000 m in the mid-west and are in good condition.

Areas not covered with gazetted forests in the middle west are mainly occupied by forests or a mixture of farmland and forests and are therefore actually covered with trees to a considerable extent. It is important to manage these trees properly to prevent their decrease in these areas.

#### 6) Population Pressure and Forest Decrease

Although the population of Kenya is increasing at the rate of 3.4% per year, some people suspect that the actual figure is higher. The present population of 23 million and the high percentage of deserts and savannas make it a realistic concern that Kenya will gradually sustain the pressure from the population and face a deterioration and decline in remaining forests.

#### (2) Necessary Considerations for Forestry Policy

##### 1) Good Coexistence between Agriculture and Forests

In recent years, "forest development" has attracted attention, people, however, interpret it in different ways such as:

- i. Forests will be entirely cut and burnt before they initiate cultivation and grazing, and the same will happen again and again.

- ii. Trees will be logged and yarded. But, "forestry" here fundamentally means tree cutting and planting for next harvesting and management for forest making. This is sustainable production of forests.
- iii. The third way is between i. and ii. Forests are often degraded by clumsy management. If management is appropriate, forests will never deteriorate. However, forest reproduction in this case of iii. is generally slower than the case of ii.

These are mentioned here because forests have recently been extensively developed by methods in i. and iii. and adverse effects on agricultural production and basin management have been reported across the country. We know that every country will suffer floods and droughts and land productivity will fall markedly unless forests have a certain share of the land.

Generally speaking, if the survival ratio of forests is 30% or higher over the entire basin, the above-mentioned adverse effects will not appear. Even if they do appear, they can be easily overcome.

Therefore, policies for conserving forests or expanding forestation should be promoted in order to prevent forests from decreasing following the increase in population and industrial development. Kenya intends to develop the necessary forestry policies by learning from failures in neighboring countries and wishes to take action before adverse effects appear. If Kenya succeeds in this attempt, good coexistence between agriculture and forests or forestry will be continuously ensured. Conversely, if forests and forestry are impaired, agriculture will inevitably decline.

## 2) Forest Conservation

As previously stated, as far as forests areas at an altitude of 1000 m or higher are concerned, their share in Kenya is much higher than 3% although lower than 30%. Accordingly, agricultural activities have been continuously managed at a

high altitude in the mid-west of Kenya. To maintain the present condition or to intend better condition in agricultural productivity, forest conservation is a minimum requirement in forestry policies.

The direct effect of forest conservation is that water, soil, and biological and forest resources will be secured and enriched.

### 3) Establishing Plantation Forests

It is not easy to make plantation forests in areas where an increasing population exerts pressure and agriculture and livestock farming are prevalent. In Kenya, however, planting forests is probably a good policy in the mid-western areas at altitudes of 1000 to 3000 m where moderate precipitation can be expected. In this case, forests should be selectively created in some areas where forestry will not compete with agriculture and livestock farming. Since Kenya is on the way to modernization, measures must be immediately taken to ensure the local supply of raw materials for paper manufacturing, building and woodcraft and firewood needed by locals in their everyday life. If forest products are thoughtlessly harvested, this situation cannot be easily corrected. Efforts should also be made in parallel to establish plantation forests to an appropriate extent.

Needless to say, forestation is part of the infrastructure project and must be begun by securing the necessary manpower and funds.

### 4) Expansion of Social Forestry

The forementioned plantation forests cannot easily be established due to various difficult factors, including funds, manpower, sites, conservation and technology.

In particular, planted trees must be routinely tendered and watched for damage for a long time.

If it is considered that many people and a large area will be needed for planting trees, that locals do not mind working for themselves, and that a planting site cannot be easily secured, it is a promising measure to promote social forestry by encouraging locals to participate. If social forestry prevails, planted and growing trees will be rarely be looted, and forests can be easily conserved. Thus, the merits of social forests are invaluable, including resources development and basin conservation.

The Kenya Social Forestry Training Project in cooperation with JICA was implemented in 1985 in order to give technical assistance to locals participating in forestry. The prospective results of the project, not to mention the existing ones, attract more expectations and attention.

A possible measure for mitigating the current pressure of population is to productively utilize semiarid areas with low precipitation near the edge of areas 1000 to 3000 m above sea level. It can be said that the Kenya Social Forestry Training Project is playing an extremely important role in the economic development of Kenya. Unless social forestry expands and continues, we think that Kenya will face difficulties in reducing population pressure, conserving land, maintaining agriculture and stabilizing the life of locals.

### (3) Possible Direction of Manpower Development

- 1) Higher education in forestry is provided at the faculty and graduate school of Moi University.

Although the majority of graduates from the faculty were previously employed by the Forestry Department, their employment has sharply decreased to a half or a third of the previous level (less than twenty in real terms) over the past few years.

Thus, forestry majors are experiencing hard times in employment after their graduation. Although the forest management staff must be increased, their employment has actually been reduced.

As this trend cannot be expected to reverse by itself, we consider that the country should watch this trend for the time being, but not unreasonably increase the number of students.

Higher education in forestry has been supported by the Finnish government, which appears to continue its support for the future.

- 2) A diploma course in forestry is provided by the Kenya Forestry College (KFC) to some members of the Forest Department who have met certain requirements.
- 3) A certificate course in forestry is also provided to some members of the Department who have met certain requirements.

This level of education is the most important for the time being. The staff engaged in field supervision, guidance and promotion of forestry mainly hold certificates.

Moreover, these activities must be further expanded and enriched.

However, there are some problems concerning certificate course. Financial difficulties have forced KFC to reduce the admission of students to below the fixed number. Moreover, it is a recent tendency that certificate holders assume more desk work than field work as do university graduates and diploma holders. People are really waiting for extension staff to be employed.

For certificates holders to expand and strengthen field supervision, guidance and promotion, it is essential to establish a system from top to bottom, secure the required budget for promotion, and evaluate their performance by giving weight to how well they could carry out their work in the field.

Education at KFC is strongly supported by GTZ and USAID.

- 4) Short-term training courses are provided mainly at KFC for the staff of the Forestry Department.

In the face of stringent finance, the staff concerned need to make efforts so that all the set courses can be completed on schedule, and it is expected that their efforts will bear fruit.

Besides KFC, the Social Forestry Training Project also provides training.

- 5) Based on these considerations, it can be judged that Moi University and KFC generally provide good education in response to the needs of the Kenya forestry industry and with support from FINIDA, GTZ and USAID.

At this moment, it is locally important to produce certificate holders and train staff responsible for extension of social forestry. Education in the certificate course has been described in Paragraph 3). The need for social forestry has been described in Section (2) Paragraph 4). In the following, promotion of future social forestry will be described.

Apart from formal forestry education, the current Kenya Social Forestry Training Project actualizes the most important thing for forestry in Kenya. It provides training at Kitui where the necessity and effectiveness of training are most clearly recognized.

If this project facilitates the establishment of systems for technological development, manpower training and extension, the accumulation of various results, it will have valuable effects on forestry and the economy of Kenya. Kenya has no choice but to promote the Social Forestry Training Project for its forestry.

For details of this project in the next phase, see the "Report on the Kenya Social Forestry Training Project by the Guidance Study Team" dated October, 1991.

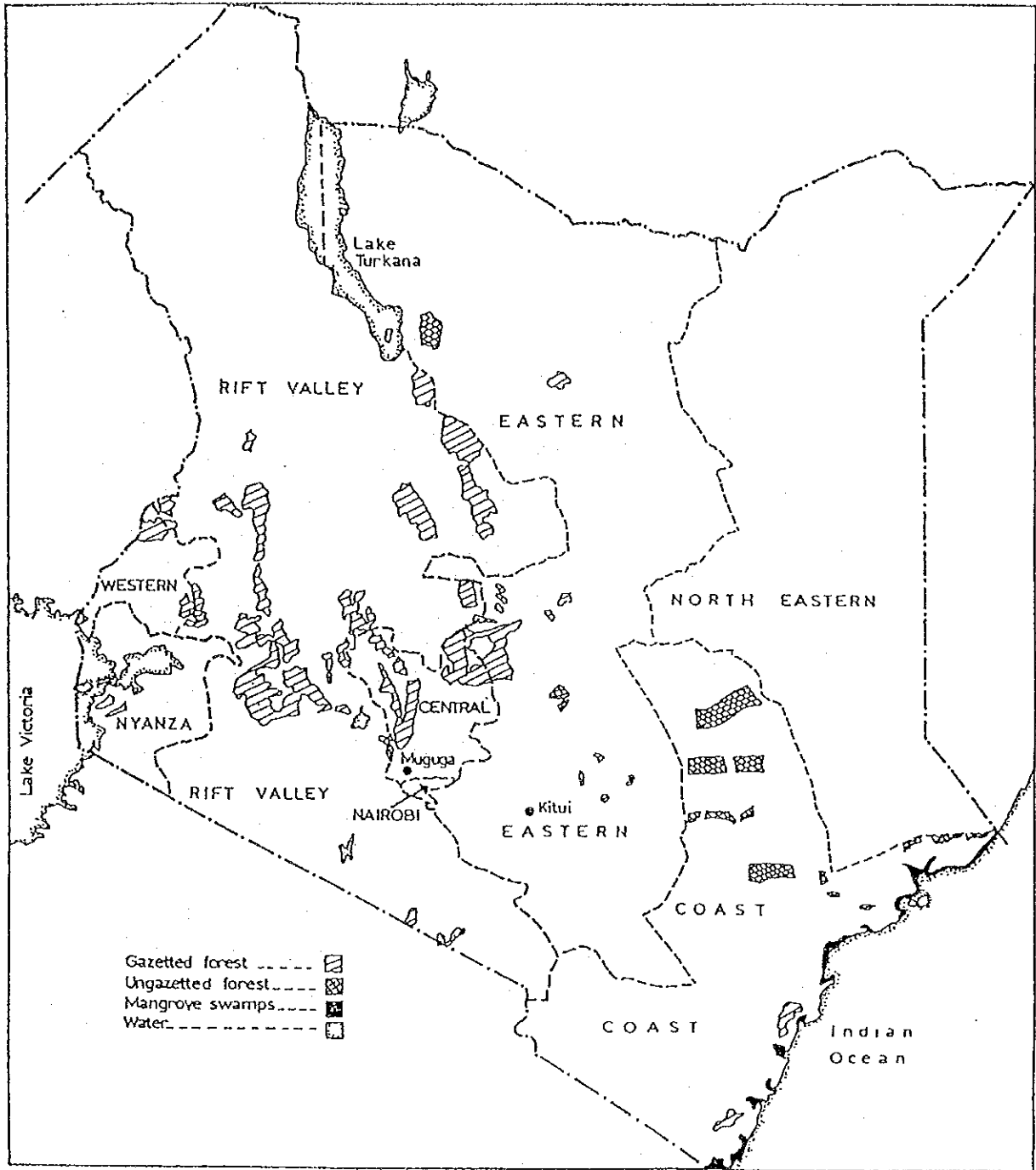


Fig. 8 Distribution of forests in Kenya







JICA