REPUBLIC OF KENYA

LAKE BASIN DEVELOPMENT AUTHORITY

THE STUDY OF INTEGRATED REGIONAL DEVELOPMENT MASTER PLAN FOR THE LAKE BASIN DEVELOPMENT AREA

FINAL REPORT

Volume 2

MASTER PLAN REPORT

October 1987

JAPAN INTERNATIONAL COOPERATION AGENCY

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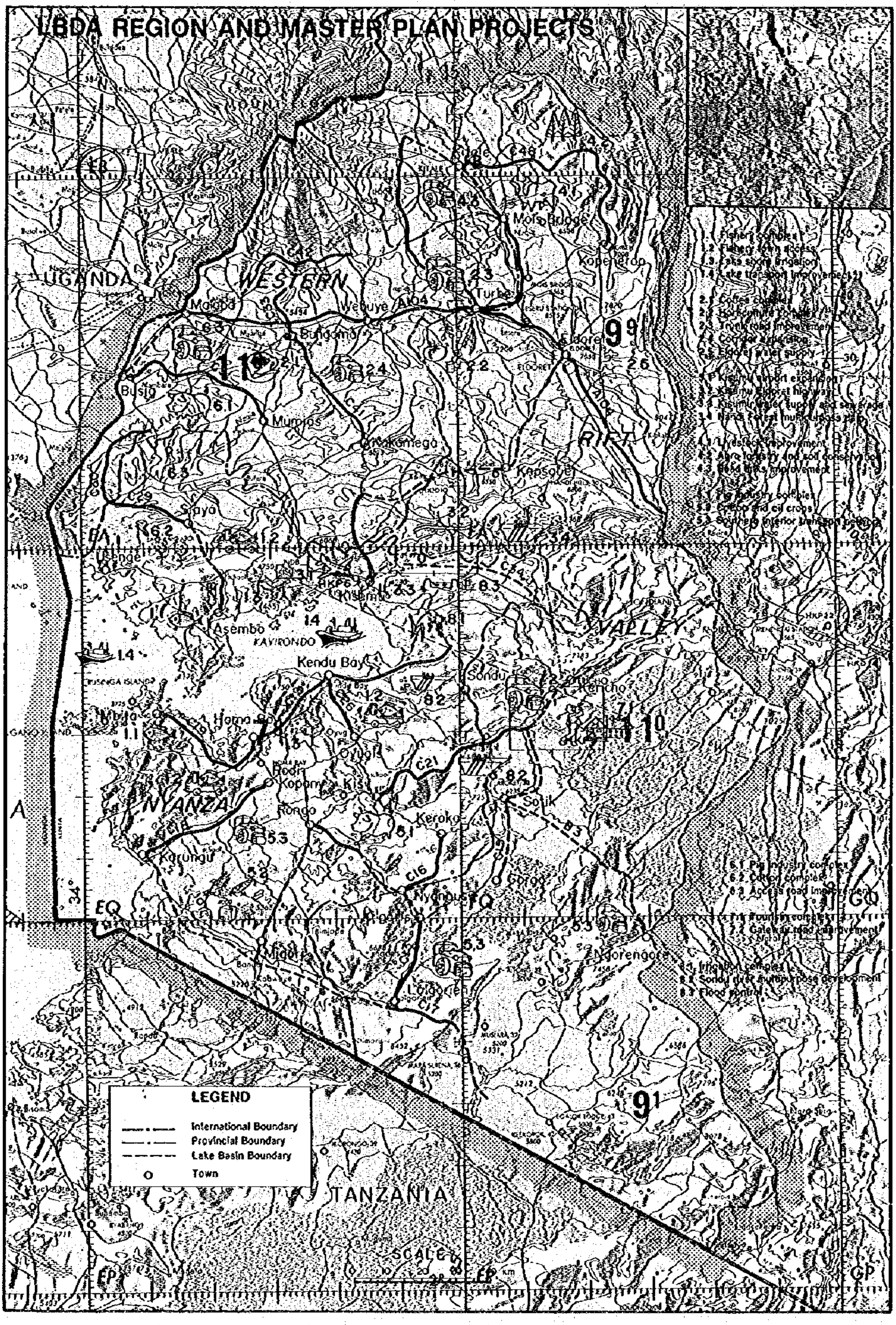

Volume 2. MASTER PLAN REPORT

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Abbreviations

ACFC	Agro-Chemical and Food Company
ADT	Average Daily Traffic
AED	African Economic Digest
AESD	Agricultural Extension and Service Division
AFC	Agricultural Finance Corporation
AI	Artificial Insemination
AIRS	Ahero Irrigation Research Station
BAT	British American Tobacco Kenya Ltd.
BOD	Biochemical Oxygen Demand
CBK	Coffee Board of Kenya
CBS	Central Bureau of Statistics
CL SMB	Cotton Lint and Seed Marketing Board
CPCS	Cooperative Production Credit Scheme
DAO	District Agricultural Officer
DC	District Commissioner
DCDC	District Community Development Committee
DDC	District Development Committee
DEC	District Executive Committee
DEO	Division Extension Officer
DFCK	Development Financial Company of Kenya
DME	Distance - Measuring Equipment
DO	District Officer
EAI	East African Industries Limited
EATEC	East African Tanning Extract Company Limited
EEC	European Economic Community
EIU	Economic Intelligence Unit
ESMAP	Energy Sector Management Assistance Programme
FAO	Food and Agriculture Organization of the United Nations
FISS	Farm Input Supply Scheme
FMD	Foot and Mouth Disease
GDP	Gross Domestic Product
GRDP	Gross Regional Domestic Product
GTZ	Germen Agency for Technical Cooperation
HCDA	Horticultural Crops Development Authority
HFA/2000	Health for All by the Year 2000 AD.
IADP	Integrated Agricultural Development Program
IBRD	International Bank for Reconstruction and Development
ICA	International Coffee Agreement
ICDC	Industrial and Commercial Development Corporation
ICIPE	International Center for Insect Physiology and Ecology
ICOR	Incremental Capital-Output Ratio
IDA	International Development Association
IDB	Industrial Development Bank
IDS	Institute of Development Studies
IE	Industrial Estate
IFAD	International Fund for Agricultural Development
ILO	International Labour Organization
ILUS	Integrated Land Use Survey
IPA	Industrial Promotion Area
IRD	Integrated Rural Development
IRRI	International Rice Research Institute
IRS	Integrated Rural Survey
JICA	Japan International Cooperation Agency
JSCE	Japan Society of Civil Engineers
KCC	Kenya Cooperative Creawerdes
KCPE	Kenya Certificate of Primary Education
KENAFYA	Kenya - Finland
KENGO	Kenya Energy Non-Governmental Organizations Association
KETA	Kenya External Trade Authority
KFA	Kenya Farmers Association
KGGCU	Kenya Grain Growers Union
KIE	Kenya Industrial Estates Limited
KITI	Kenya Industrial Training Institute
K£	Kenya Pounds (20 Kenya shillings)
KMC	Kenya Meat Commission
KNAIS	Kenya National Artificial Insemination Service
KPCU	Kenya Planters Cooperative Union
KPLC	Kenya Power and Lighting Company Limited
KQ	Kenya Airways
KRC	Kenya Railways Corporation
KREDP	Kenya Renewable Energy Development Programme
KSA	Kenya Sugar Authority
KSB	Kenya Sisal Board
KSC	Kenya Seed Company
Kshs	Kenya Shillings
KSS	Kenya Soil Survey
KTDA	Kenya Tourism Development Authority
KTDA	Kenya Tea Development Authority

KWDP	Kenya Woodfuel Development Project
LBDA	Lake Basin Development Authority
LPG	Liquefied Petroleum Gas
LSI	Lake Shore Irrigation
LU	Livestock Unit
MCH/FP	Matenal Child Health/Family Planning
MOLG	Ministry of Local Government
MOA	Ministry of Agriculture
MOALD	Ministry of Agriculture and Livestock Development
MOERD	Ministry of Energy and Regional Development
MOEST	Ministry of Education Science and Technology
MOH	Ministry of Health
MOLD	Ministry of Livestock Development
MOPND	Ministry of Planning and National Development
MOTC	Ministry of Transport and Communication
MOWD	Ministry of Water Development
MP	Member of Parliament
MSC	Mumias Sugar Company
MSS	Multispectral Scanner
MSY	Maximum Sustainable Yield
NCC	National Construction Corporation
NCPB	National Cereals and Produce Board
NCST	National Council for Science and Technology
NEP	National Energy Policy
NEP	National Extension Project
NGO	Non-Governmental Organization
NIB	National Irrigation Board
NMWP	National Master Water Plan
NSCC	New Seasonal Credit Scheme
OD	Origin-Destination
OECD	Organization for Economic Cooperation and Development
PBME	Project Benefit Monitoring and Evaluation
PC	Provincial Commissioner
PCU	Passenger Car Unit
PHC	Primary Health Care
PIU	Provincial Irrigation Unit
RAES	Rural Afforestation Extension Service
RIDC	Rural Industrial Development Center
ROK	Republic of Kenya
RTPC	Rural Trade and Production Center
RWSDP	Rural Water Supply Development Project
SCIP	Smallholder Coffee Improvement Project
SEFC	Small Enterprise Financial Corporation
SEP .	Special Energy Programme
SP1	Sessional Paper No.1 of 1986 on Economic Management for Renewed Growth
SPSCP	Smallholder Production Services and Credit Scheme
SRRP	Smallholder Price Rehabilitation Project
SSIOP	Small Scale Irrigation Development Project
SWAP	Surface Water Extraction Permit
T&V	Training and Visit
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific, and Cultural Organization
UNCEF	United Nations International Children's Emergency Fund
UNIDO	United Nations Industrial Development Organization
USAID	United States Agency for International Development
VOR	Very High Frequency Ommidirectional Radio Range
WHO	World Health Organization

Abbreviations of Measures

Length

mm	=	millimeter
m	=	meter
km	=	kilometer

Area

ha	=	hectare
km^2	=	square kilometer

Volume

ℓ	=	lit = litre
m^3	=	cubic meter
MCM	=	million cubic meter

Weight

mg	=	milligram
g	=	gram
kg	=	kilogram
t	=	ton = MT = metric ton

Time

sec	=	second
hr	=	hour
d	=	day
yr	=	year

Money

Kshs.	=	Kenya shilling
K£	=	Kenya pound
US¢	=	U.S. cent
US$	=	U.S. dollar

Energy

kcal	=	kilocalorie
J	=	joule
MJ	=	megajoule
HP	=	horsepower
TOE	=	tons of oil equivalent
kW	=	kilowatt
MW	=	megawatt
kWh	=	kilowatt-hour
GWh	=	gigawatt-hour

Others

%	=	percent
°	=	degree
'	=	minute
°C	=	degree Celsius
cap.	=	capita
LU	=	livestock unit
md	=	man-day
mil.	=	million
no.	=	number
pers.	=	person
PCU	=	passenger car unit

CHAPTER 1 INTRODUCTION

1.1 Background

1.1.1 Background of technical cooperation

The Kenyan Government has been placing increasing emphasis on regional balance in the Country's socio-economic development. As a main organizational strategy for regional development, the Lake Basin Development Authority (LBDA) was established in 1979 by an Act of Parliament. The prime objective of LBDA is to plan, to coordinate and to implement development projects in the Lake Victoria catchment area belonging to Kenya.

Since its establishment, LBDA has been conducting a number of studies on different aspects of the development of LBDA region (the Region), and some projects have been partly implemented. None of the studies, however, have taken into account the overall requirements of the Region nor accorded priorities to different development activities. Also there exist conflicts and contradictions between some of the study results, and the coordination among projects is necessary for more efficient promotion and implementation of the projects. With these in view, the Kenyan Government submitted in February 1984 an official request to the Japanese Government for technical cooperation of preparing an integrated long-term development master plan for the Region.

In response to this request, the Japanese Government made a decision to send a contact mission to Kenya in order to clarify the background and specifics of the request and to discuss with the Kenyan side (Ministry of Energy and Regional Development as well as LBDA) the possibility and the scope of cooperation by the Japanese Government. The mission was dispatched in March 1985 by the Japan International Cooperation Agency (JICA), the official agency responsible for the implementation of technical cooperation of the Japanese Government.

Furthermore, JICA dispatched in July 1985 another mission to Kenya to discuss in more detail and in more specific terms the scope of this technical cooperation. The Scope of Work (S/W) was concluded between Kenyan and Japanese sides and signed by respective representatives on August 5, 1985.

1.1.2 Study organization

The study of Integrated Regional Development Master Plan for the Lake Basin Development Area has been carried out by a study team appointed by JICA in close collaboration with its counterpart team appointed by LBDA. Members of the JICA study team and the LBDA counterpart team are listed in Table 1.1. Numerous other persons, including many district and provincial officers, contributed to the study by participating in the seminar and the workshop held in connection with the study as described in the next subsection and also by providing useful data and information on other occasions.

In order to guide the execution of the study, the Kenyan Government established a Steering Committee chaired by the Deputy Permanent Secretary of the Ministry of Energy and Regional Development. The Steering Committee met several times throughout the study period to discuss the contents of a series of reports submitted by the study team.

An Advisory Committee was established by JICA to review the findings by the study team. The Steering Committee and the Advisory Committee have maintained a close liaison by meeting and exchanging views on the occasions of report submission by the study team. Members of the Committees are as listed in Table 1.2.

1.2 Study Procedure and Methodology

1.2.1 Study procedure

The study of Integrated Regional Development Master Plan for the Lake Basin Development Area has been carried out through the following six steps, as specified by the S/W.

Step 1: Analysis of the present situation for development,
Step 2: Identification of the development potential,
Step 3: Preparation of overall development framework,
Step 4: Preparation of an integrated development master plan for the total study area,
Step 5: Identification of possible priority projects for the provinces of Nyanza and Western, and
Step 6: Preparatory study of high priority projects.

In accordance with this six-step procedure, most parts of Steps 1 and 2 were covered in the first stage of the study, extending from January through March, 1986. Data and information necessary for the study were collected by JICA team members and LBDA counterpart personnel from many Central Government headquarters and provincial and district offices. Also all the 15 districts were visited by the JICA/LBDA team to explain the purposes, procedure and expected outcomes of the study and to ask for the cooperation of district officers. The results were compiled into Progress Report 1 submitted in March, 1986.

Following this, the second stage started in May with supplementary works of Steps 1 and 2, and the framework for the Region's development was subsequently formulated. In order to present interim results of the study to a wider audience and to receive comments, a workshop was organized by the JICA/LBDA team, on the 24th and the 25th of July in Kisumu. Very active discussions took place with the participation of representatives of all the 15 districts and related ministries. Progress Report 2 was compiled including the results of these activities, reflecting also the workshop discussions, and submitted in August, 1986.

Step 4 for preparing an integrated regional development master plan for the Region started immediately after the submission of Progress Report 2. The study proceeded with the close collaboration of the JICA study team and the LBDA counterpart team. In addition to occasional discussions on individual basis, two major working sessions were held with the participation of most members of the joint LBDA/JICA team. In the first one on September

22, methodologies for project formation and prospective projects were discussed; subjects in the second session on October 14 included institutional aspect, evaluation criteria and integrated rural development. The JICA/LBDA team conducted the second round of district visits, and the outline of the draft master plan was explained to all the 15 districts.

The Interim Report was compiled including a recommended integrated regional development master plan for the LBDA region and submitted in November , 1986. It clarified important development projects with phasing of implementation and associated institutional measures necessary to complement the project implementation.

At the time of submission of the Interim Report and thereafter, the selection of high priority projects for the provinces of Nyanza and Western was discussed between LBDA and the JICA study team (Step 5). As a result, those high priority projects were selected for which a preparatory study was carried out in the third stage extending from January through March, 1987 (Step 6).

In parallel with the preparatory study, the Master Plan presented in the Interim Report was further elaborated on, and sector reports associated with the Master Plan were prepared, coordinated with one another as well as with the Master Plan. In preparing the sector reports and the report on the preparatory study, a series of meetings were held by the JICA study team and its LBDA counterpart team. Based on the discussions during the meetings and on other occasions, each sector report was compiled by the joint efforts of the JICA/LBDA team.

In order to convey the main contents of the Master Plan to a wider audience, a seminar was organized on the 9th and 10th of February in Kisumu. Representatives of most districts in the Region (11 out of 15), Ministries of Energy and Regional Development, Planning, Agriculture, Transport and Communication and Water Development attended the seminar together with the JICA/LBDA team. Discussions during the seminar were incorporated in the Master Plan.

The Draft Final Report was compiled including all the study results and submitted in March. The National Steering Committee met on the 24th of March, 1986 in Nairobi to acknowledge the receipt of the report and discuss its contents. Each member of the Committee was requested to examine the report in detail and prepare its comments. Another Committee meeting was held in Nairobi on 14th of April, 1986, bringing all the comments for further discussion. The comments were compiled and transmitted to JICA. The JICA study team modified the report incorporating the comments and prepared this Final Report.

1.2.2 Analytical framework and methodology

While communicating with a range of people concerned as outlined above to reflect in the plan the reality of the Region and Kenya, consistent analytical framework and methodology were used to ensure that study results of different sectors would be well coordinated for an integrated plan. These analytical framework and methodology are outlined here. Details are found elsewhere as indicated.

Following the procedure described above, development objectives were clarified and basic strategy drawn up, based on the analysis of existing conditions with the aid of problem structure analysis (subsection 2.1.2). A few analyses were conducted in parallel to evaluate the development potential from different viewpoints. Land capability was evaluated based on land gradient, agro-ecological zoning system, present land use and land use control (subsection 4.1.2, Sector Report). Water demand/supply balance was conducted by sub-catchment based on the availability of surface and ground water and the present and future water use (Section 7.3, Sector Report).

It was found that general water availability and existing transportation network and settlement patterns would be the two principal factors prescribing the future development of the Region. Thus the spatial development potential was evaluated by using these criteria(subsection 4.1.1). Combing the results of land capability analysis and the analysis of spatial development potential, priority areas for future development were identified (subsection 4.2.1).

In the meantime, alternative development scenarios were presented, describing alternative courses of development, main roles and functions of Region (Section 3.2). A development framework was specified quantitatively by using selected socio-economic indices, in a way consistent in macroscopic aspects with the basic concepts of each scenario (Section 3.3).

Sector analyses were conducted to see how each production sector would respond to the alternative frameworks. Specifically value-added was estimated for agriculture, livestock, fishery and manufacturing sectors to see if targets set by the development frameworks may be attained. The development frameworks were adjusted as a result and the recommended framework was selected eventually. At the same time, conditions for development in different sectors were clarified, including institutional measures required as prerequisites.

The value-added by crop in agriculture and in livestock was interpreted to land use requirements, and the general land use plan was prepared from the land capability evaluation (subsection 4.1.2). Referring to the priority area for development identified and consistent with the land use plan, priority projects were formulated to constitute area development schemes (subsection 4.2.1). Associated institutional measures were clarified by adjusting requirements in different sectors.

1.2.3 Planning units

The study covers the entire jurisdiction of LBDA, which is coterminous with the catchment area of all the rivers in Kenya draining into Lake Victoria. This area is the ultimate planning unit.

The Region consists of all the seven districts in Nyanza and Western Provinces, and Kericho, Nandi, Trans Nzoia and Uasin Gishu districts and parts of Narok, Nakuru, West Pokot and Elgeyo Marakwet districts in Rift Valley Province. In accordance with the national policy of "District Focus for Rural Development," these districts constitute another tier of planning units. That is, existing conditions, constraints and potential are examined not only for the Region as a whole but also by district (Section 2.3). Basic strategy is also clarified by district (Section 3.4) as well as for the Region.

Another kinds of planning units are presented by sub-catchment areas. The Region is sub-divided into the drainage areas of seven major rivers - Sio/Malaba, Nzoia, Yala, Nyando, Sondu, Kuja/Migori and Mara - and the remaining area drained by other small rivers. Each catchment area naturally serves as another planning unit, as anything planned or implemented upstream has bearings on what is or can be done downstream.

These last planning units, however, are not very prominent in the Region for a few reasons. First, the rivers in the Region are relatively small and do not serve for inland navigation to connect respective upstream and downstream areas. Second, the transportation (especially road) network has been fairly well developed in the Region so that neighbouring catchment areas are well connected even in the most mountainous areas. An implication is that a certain area may be more strongly connected to its neighbouring areas in other catchment areas than areas in the same river basin further away. Thus in most cases, planning for economic activities should not be constrained by the catchment area boundaries.

Therefore in this planning study, the catchment areas as planning units are used mostly for planning water resources development and management and thereby reflected in the Master Plan. Water demand and supply balance is analyzed by subcatchment area and reflected in the evaluation of spatial development potential (Section 4.1). The results are used to formulate water-storage and inter-basin diversion projects. Elements of catchment conservation are incorporated in the projects formulated in the upper catchment areas of major rivers.

1.3 Composition of the Report

1.3.1 Final Report

This Final Report on the study of Integrated Regional Development Master Plan for the Lake Basin Development Area consists of seven volumes as follows.

Volume	I	:	Executive Summary Report
Volume	II	:	Master Plan Report
Volume	III	:	Sector Report 1: Agriculture, Livestock and Fishery
Volume	IV	:	Sector Report 2: Manufacturing, Mineral Resources and Tourism
Volume	V	:	Sector Report 3: Water Resources, Transportation and Energy
Volume	VI	:	Sector Report 4: Land Use and Human Resources
Volume	VII	:	Report on Preparatory Study

Executive Summary Report contains the summary contents of the Master Plan for easy use by executive officers and others. Master plan Report is this volume and its organization is described below.

Sector Report is divided into four volumes and consists of 11 chapters, each containing results of sector study conducted for each sector associated with this Master Plan study. Report on Preparatory Study contains the study results of three high priority projects selected from among 27 Master Plan projects : viz. Lake shore irrigation project, pig industry complex project, and animal feed industry project.

1.3.2 Organization of the Master Plan Report

The remaining part of this Master Plan Report is organized in the following way. Chapters 2 through 4 together constitute an integrated regional development master plan for the Region. Chapter 2 presents the development objectives based on the examination of development potential and problems. In Chapter 3, development scenarios and strategy are described, and targets for Region's development to the year 2005 are clarified.

Chapter 4 contains the presentation of a recommended master plan itself. First in Section 4.1, the spatial system prescribing the Region's development is examined from the points of view of both urban and transportation system and land use pattern and capability. Development schemes and projects are presented in Section 4.2. In Section 4.3, various conditions for development are examined, including resources capacity, phasing, institutional and social aspects. The recommended Master Plan is articulated in Section 4.4 together with its evaluation by several criteria.

Table 1.1 Members of the JICA Study Team and the LBDA Counterpart Team

JICA Study Team

Team Leader

I. Kuno (NK)

Members

Regional planning	T.	Hashimoto (NK)
Agricultural development	T.	Yamazaki (NK)
Irrigation planning	A.	Kojima (NK)
Land use/Soil/Landsat analysis	M.	Koyama (NK)
Inland fishery	K.	Souma (NK)
Livestock	T.	Nagamitsu (NK)
Industrial development	Y.	Sunago (MRI)
Mineral resources	T.	Terae (NK)
Commodity flow/ Tourism	R.	Nishimiya (MRI)
Water resources planning	M.	Nakashima (IDCJ)
Flood control/ Hydrology	T.	Takenaka (NK)
Transportation planning	T.	Yoshida (MRI)
Roads/Railroad	H.	Miyake (MRI)
Ports/ Inland navigation	K.	Kasajima (MRI)
Energy economy	T.	Kimura (IDCJ)
Geology	S.	Sato (NK)
Regional economy	K.	Mera (NK)
Human resources	R.	Nagase (NK)

LBDA Counterpart Team

Deputy Managing Director of LBDA

S. M. Machooka

Original Members

D. L. Mshila
A. P. Achieng
S. Buckens
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A. Okinda
N. R. Olina
L. J. Poyck
E. H. J. Schroten
T. C. Thomas (UNDP)
M. Wafula

Abbreviations:

NK	Nippon Koei Co., Ltd.
MRI	Mitsubishi Research Institute
IDCJ	International Development Center of Japan

Table 1.2 Members of the Steering Committee

National Steering Committee of Kenya

Chairman	:	D. J. O. Okiro (Meeting on March 24, 1986) Alfred Viena (All other meetings)
Member organizations	:	Ministry of Energy and Regional Development (Chairman) Office of the President Ministry of Agriculture Ministry of Livestock Development Ministry of Water Development Ministry of Enviroment and Natural Resources Ministry of Works, Housing and Physical Planning Ministry of Finance Ministry of Planning and National Development Ministry of Commerce and Industry Ministry of Tourism and Wildlife Ministry of Transport and Communication Kenya Power and Lighting Company Limited Institute of Development Studies - University of Nairobi Lake Basin Development Authority

CHAPTER 2 DEVELOPMENT OBJECTIVES

2.1 Development Potential and Problems

2.1.1 National economy and Region's potential

(1) National economy

Overview of past performance

In the first years of independence, Kenya's economy made a steady growth and the annual growth rate averaged 5.8% during 1964 to 69. The economic growth accelerated in the early 1970's but thereafter it slowed down significantly except the period of coffee boom (1977 to 78). This slow down is primarily due to a series of sharp increases in prices of crude oil, for which Kenya depends totally on imports. The annual growth rate in the 1970's was 5.1% on average.

Kenya's economy has been generally slow-moving in the early 1980's partly reflecting international recession. The growth rate of GDP fell below the population growth in 1982, resulting in a decrease in the per capita GDP. In 1983, Kenya's economic performance started to show a sign of recovery, but the optimism was soon frustrated by the severe drought that hit the sub-Sahara region of Africa. The drought turned out to be the worst ever for Kenya, and as a result the real growth rate in 1984 fell to only 0.9%.

Kenya's economy has made a remarkable recovery from the drought in 1984, owing much to favourable climate and international market situations for its major export crops, and recorded the real growth of 4.2% in 1985.

Gross domestic product

The gross domestic product (GDP) of Kenya in the past few years is presented in Table 2.1 by economic sector. The share of agriculture, forestry and fishery sector has been steadily declining, but still this sector stays to be a dominant sector, accounting for about one-third of the GDP, both the traditional and the monetary economies combined. Importance of this sector for majority of people, however, is in fact much greater than appears from its share in the GDP, as over 80% of the country's population live in rural areas, deriving their incomes primarily from agricultural activities. The share of the manufacturing sector has been around 12%. The total GDP and population in Kenya were about K£4,126 million and 20.2 million in 1985, making the per capita GDP about K£204. However, there exist wide disparities in per capita gross regional domestic product (GRDP) of different regions. The share of GDP in the Central Province and Nairobi combined is close to 50%, while their population share is about 20%. Thus the average per capita GDP excluding these two regions was no more than K£145 in 1985.

Import/export and balance of payments

The agricultural sector has been contributing to about 50% of the total export value in the past several years. In particular, two main crops --- viz.coffee and tea -- together account for some forty percent, although their shares vary considerably year to year as international market prices fluctuate (see Table 2.2). Another major export commodity is petroleum products, whose share in export had rapidly increased to attain 30% level by 1980, but thereafter it has been decreasing to become below 20%. Still about two-thirds of the total export earnings is derived from these commodities. Such high dependence on these few products as foreign exchange earners makes the Kenya's economy vulnerable to natural conditions and changes in international markets.

Composition of imports is characterized by a large share of fuels, which has been over 30% of the total import value in recent years (see also Table 2.2)

These facts, together with the lack of fossil fuel resources, are primarily responsible for the aggravating balance of payments (see Table 2.3). The trade balance improved slightly in 1983 but became worse in 1984 due to emergency food imports, despite the favourable price trends for tea and coffee.

(2) Region's potential

Region's position

The Region is defined as the entire catchment areas of all the rivers draining into Lake Victoria, which is under the jurisdiction of LBDA. It occupies 47,709 km^2 (exclusive of the Kenya part of Lake Victoria) in the western part of Kenya, accounting for about 8.4% of the total land area of Kenya i.e. 569,137 km^2 .

The Region consists of all the seven districts in Nyanza and Western Provinces, and Kericho, Nandi, Trans Nzoia and Uasin Gishu districts and parts of Narok, Nakuru, West Pokot and Elgeyo Marakwet districts in Rift Valley Province. The population in the Region is estimated to be 8.1 million in 1985, corresponding to slightly over 40% of the total population in Kenya, which is estimated at 20.2 million in the same year. The average population density is calculated to be 170/km^2 for the LBDA region and 36/km^2 for Kenya.

Value-added in the Region was estimated for 1967 and 1976 as shown in Table 2.4, based on the figures for provincial value-added in 1967 through 1976 which were estimated by IDS as there exist no data officially published on the gross regional domestic product (GRDP) of any region (Bigstein, A, "Regional Inequality in Kenya", IDS, University of Nairobi, November 1977). The estimated value-added were classified into three broad categories: viz. subsistence and modern agriculture sector,manufacturing and mining sector, and services sector.

As seen from Table 2.4, the share of subsistence and modern agricultural sector was slightly declining, that of services sector slightly increasing, and that of manufacturing and mining sector staying practically the same. The share of LBDA's GRDP in Kenya's GDP declined slightly from 24.2% in 1967 to 22.4% in 1976.

In constructing the column for 1985 in Table 2.4, the share of GRDP in GDP was assumed to be 23.5%, which is an average of the corresponding values in 1967 and 1976, but the value-added was estimated based on estimated production volumes for the subsistence and modern agriculture sector and manufacturing sector, while the value-added of service sector was obtained as a balance between GRDP and the sum of value-added in the other two sectors. The figures estimated show that the subsistence and modern agriculture sector still claims the dominant share of 62.9% in 1985. The shares of other sectors are 7.7% for manufacturing and mining sector and 29.4% for services sector.

Although the share of GRDP of the Region in GDP of Kenya is much smaller than its population share, the Region's economy contributes more significantly to the national economy in some aspects. Region's shares of agricultural production in Kenya between 1976 and 1984 are given below for major crops (Chapter 1, Sector Report).

CROPS	KENYA (1000 tons)	LBDA (1000 tons)	
Maize	2,084	1,504	72%
Sorghum Millet	265	54	20%
Beans	244	77	32%
Rice (Dry paddy)	40	8	20%
Root crops	887	693	78%
Sugarcane	3,542	3,488	98%
Seed Cotton	25	15	60%
Coffee	90	5	6%
Tea	190	125	66%
Wheat	204	156	76%

Notes: Figures for Kenya derived from FAO Production Year Book 1979-85, and those for LBDA estimated by JICA Study Team, Table 3.3

The total catch of Lake Victoria fisheries rapidly increased in late 1970's and early 1980's to account for over 80% of fresh water fish production in Kenya in the past few years. Of the total fresh water fish production of 99,764 tons in Kenya in 1985, Lake Victoria catchment contributed 88,589 tons (Chapter 3, Sector Report).

Manufacturing activities in the Region are dominated by agro-industries. Agro-industries account for 927 establishments or 87.7% of the total manufacturing units, 94.4% of output value, 95.6% of value-added and 94.4% of employment in the formal manufacturing sector of the Region. Most industries have shares in the total output in Kenya much lower than the population share, except the sugar and confectionery industry and textile industry (Chapter 4, Sector Report).

Potential

The Region is relatively rich in water resource (Chapter 7, Sector Report). Over 70% of the total land area in the Region is classified as either high or medium potential based on average annual rainfall, accounting for close to 40% of the total land in these categories in Kenya. Climatic conditions are generally favourable for livestock development (Chapter 2, Sector Report). Soil conditions are also generally favourable for cultivation, although some soil types require proper fertilization or intensive drainage (Chapter 10, Sector Report).

Potentials for livestock and fishery development are high due first to cultural heritage of the dominant people in the Region and second to improving production practices. Having these primary production activities as a basis, the manufacturing sector has also much potential for expansion.

Human resources constitute another important asset of the Region. The population, accounting for over 40% of the total population in Kenya, is a mixture of many ethnic groups having various socio-cultural backgrounds (Chapter 11, Sector Report). Thus any emerging opportunities in the Region will be seized by different people, provided that various social needs of the people are satisfied such as education, technical training and health care.

Other major resources include energy resources in the form of hydropower (Chapter 9, Sector Report), some mineral resources (Chapter 5, Sector Report), fish stock in Lake Victoria, strategic location in the defunct East African Community being substantially reinstated recently, the vicinity to Lake Victoria and the existence of a few tourism attractions (Chapter 6, Sector Report). In addition, the transportation network has been fairly well established as long as trunk roads and railways are concerned (Chapter 8, Sector Report).

2.1.2 Development problems

Despite its potential outlined above, the Region faces many problems due to various factors interacting one another to constitute constraints to development. They are classified into (1) natural factors, (2) institutional factors, and (3) human factors. Major factors and more important interactions between them are shown by the problem structure of the Region in Figure 2.1.

Of the natural factors affecting the development, the more important ones seem to be the following.

(1) Uneven distribution of water resources in time and space, which causes floods and droughts, and also becomes a factor for soil erosion;

(2) Paucity of exploitable energy sources, which makes the Region more dependent, on the one hand on woodfuel, causing devastation of forests, and on the other hand on imported petroleum, so that the industries have not been much established; and

(3) Environmental conditions that tend to promote communicable and vector-borne diseases such as malaria, schistosomiasis and sleeping sickness.

The unreliable water resources also hinder more intensive agricultural activities to take place in some areas. The higher incidence of diseases is one of factors not only for higher mortality rates but also increased child births in the Region.

Institutional problems in the Region may be traced back to management policies during colonial times as well as inadequate regional development and public investment efforts in the past. More fundamental problems in this category are:

(1) lack of adequate development institutions, and insufficient planning and project implementing capacity,

(2) under-utilization of land, and

(3) problems with land tenure system.

The first problem takes the forms of under-development of social and economic infrastructure, unexploitation of indigenous resources and lack of proper environmental management. The under-utilization of land, together with delay in land adjudication in some parts of the Region and sub-division of registered land, is represented by inefficiency and low productivity in agriculture.

Of the problems related to human resources in the Region, the following may be pointed out as more fundamental ones. That is,

1) lack of adequate delivery of health services, and
2) insufficient opportunities for higher education and economic activities.

The present uneven distribution of population and high population density in some areas are a consequence of these problems.

These more fundamental problems described above have resulted in a range of problems currently observed in the Region, which may be classified into environmental, economic and social problems. Environmental problems include, in addition to devastation of forests and soil erosion mentioned above, disruption of land ecosystem, increasing sediment transport and degradation of water quality, which tend to be aggravated due to lack of proper environmental management.

The under-development of infrastructure and unexploitation of resources as well as paucity of energy resources make the Region less favourable for industrial location. Coupled with the low productivity in agriculture, the Region's economic structure stays immature, and the per capita income is still low. Social problems range from uneven distribution of income and social services to rural poverty, malnutrition, poor sanitary conditions and others.

2.2 Development Objectives

2.2.1 National development objectives

The long-term objectives of the nation have remained in substance unchanged since the independence and continue to provide guidelines for the formulation of development policies and strategies. They include sustained economic growth and equitable development as well as other objectives related to basic human needs and socio-cultural ideas.

Sessional Paper No.1 of 1986 is meant to re-establish the development targets along the line of the long-term objectives, based on the recognition that the country must enter a new phase of development. Development objectives for the nation as set out in the paper are summarized as follows:

(1) to attain high rates of economic growth,
(2) to create employment opportunities for expanding labour force,
(3) to better rural/urban balance,
(4) to satisfy basic needs of people,
(5) to ensure food security, and
(6) to promote industrialization.

The paper also describes major constraints to growth: i.e. savings, productivity of investments, Government finance and management, and foreign exchanges.

The sessional paper has set very ambitious growth target of 4.8% for 1984 to 1988 and 5.9% for 1988 to 2000, on the conditions that concerted efforts should be made in all aspects as spelled out in the paper, including policies, institutions and incentive systems for private sector activities, in order to attain unprecedented growth. Those conditions at the national level are taken to be generally applicable in this planning study.

2.2.2 Regional development objectives

Based on the Region's position in the national economy as well as potential and constraints outlined in Section 2.1 and the national development objectives listed above, development objectives for the LBDA region are set as follows.

(1) To narrow the income disparity between the Region and the whole of Kenya;
(2) To contribute to national economic development and food security by maximizing agricultural production;
(3) To improve Region's economic structure by promoting manufacturing industry capitalizing on its agricultural base; and
(4) To create employment opportunities in order to minimize the drift of people out of the Region.

2.3 Development Performance, Problems and Potential by District.

Kisii

Under the favourable climate and fertile soil conditions, the district land of 223,000 ha is intensively utilized for agriculture. Food crops dominate the cultivation with maize (planted area,45,000 ha), beans (12,000 ha), bananas (10,000 ha), sorghum/millet (5,000 ha) and sweet potatoes (4,000 ha). Important cash crops are tea (11,000 ha) and Arabica coffee (5,000 ha).

Much efforts are being made to improve the livestock sector by upgrading Zebu cattle, promoting zero grazing and other means. The potential feed productivity of the managed pasture (26,000 ha) and fodder fields (21,000 ha) is high enough to sustain all the existing cattle consisting of 29,000 heads of grade cattle and 133,000 heads of local cattle.

Limited availability of land and high population density certainly constitute major constraints to development. For bananas, lack of proper marketing channels is a constraint.

Kisumu

Kisumu district has a few distinct characteristics: (1) Kisumu municipality, the third largest city in the Republic with the population over 210,000 and many industrial and commercial establishments, (2) vast Kano Plain where small-scale, subsistence-oriented agriculture is predominant with the average holdings size of 2.2 ha and many landless households (21% of rural households in 1979), and (3) sugar belt extending on the piedmont plain on the foot of Nyando escarpment.

Crop production by smallholders covers a total extent of 36,000 ha, of which 21,000 ha of farm land are used for maize, sorghum and beans production. Root crop production is also prevailing with a total area of 5,000 ha. Rice is planted in the low-lying land of 1,000 ha under both irrigated and rainfed conditions. Ahero Scheme plays a nucleus role for rice cultivation in the district. Rainfed or swamp rice is cultivated on the Lake shore, i.e. Wasare, although the planted area is limited at less than 1,000 ha. Cotton is an important cash crop in the district. Some 7,000 ha are used for this crop at present. Sugarcane covers 53,000 ha or 60% of the total agricultural land.

Agricultural development in most part of the district is constrained by combinations of unfavourable factors such as extremely heavy soil, warm climate, relatively low rainfall and habitual floods. The existing land tenure dominated by smallholders makes this situation even more difficult. Also the traditional practice of stock raising suffers from low productivity of fodder crops and pasture shortage. For the total of 126,000 LU's consisting of 1,000 heads of grade cattle, 161,000 heads of local cattle and 69,000 heads of sheep and goats, the total feed availability remains at 82,000 LU's equivalent.

Siaya

Siaya is one of less developed districts in the Region. The people are engaged mostly in subsistence agriculture, cultivating maize (27,000 ha), sorghum (16,000 ha), cassava

(12,000 ha), beans (11,000 ha) and other food crops, sometimes in combination with small-scale fishery and stock raising. Only significant cash crops are cotton (9,000 ha) and sugarcane (3,000 ha). Out of 252,000 ha of the district land, 93,000 ha are used for agriculture, leaving much land unutilized under bush.

Livestock development in the district is facing feed shortage. For 179,000 heads of local cattle and 47,000 heads of sheep and goats, equivalent to 136,000 LU's, only 120,000 LU's of feed are available. District's agriculture is constrained among others by limited rainfall and soils of low fertility.

South Nyanza

Out of 571,000 ha of the district land, 190,000 ha are used for agriculture. Crop fields in general are widely but sparsely distributed in the district. Exceptions to such a general land use pattern are the lands intensively used for agriculture in and around Rongo and Migori along the boundary with Kisii district. The main food crops are maize (45,000 ha), cassava (20,000 ha), sorghum (19,000 ha), beans (13,000 ha) and sweet potatoes (8,000 ha). Cotton and sugarcane are representative cash crops, commanding the area of 24,000 ha and 10,000 ha, respectively.

Other production activities have relatively high potentials but are not picking up yet as significant contributors to the district's economy. Fishery and livestock are important due to cultural heritage of the dominant people in the district. The population of grade cattle is limited at 1,000 heads, but 430,000 heads of local cattle and 105,000 heads of sheep and goats are extensively grazed.

The district suffers from insufficient provision of infrastructure, and particularly from improper roads and water management. Except the trunk road A1, most roads are either gravel or earth. Lack of proper water management results in poor water supply even in larger population centers, lack of significant irrigation and loss of crops and cattle due to occasional floods.

Bungoma

Bungoma is one of most versatile districts both in existing conditions and in future prospects. Of the total area 307,000 ha, some 151,000 ha are presently cultivated with a variety of food crops and cash crops. Main food crops are maize (51,000 ha), beans (14,000 ha) and root crops (7,000 ha), and cash crops are represented by Arabica coffee (3,000 ha), cotton (5,000 ha) and sugarcane (10,000 ha). There is also much room for expanding cultivated areas for these and other crops including beans, rice and horticultural crops.

Fishery and forestry activities are also substantial in the district. Fish production can be much increased, if existing county dams (some 30 in number)are converted into fish dams as requested by LBDA. Eight tree nurseries are fully utilized, and need further expansion.

Bungoma town and a few other secondary towns present another opportunity for the district's development. In addition to existing industries such as paper mill at Webuye,

cotton ginnery and tobacco leaf center in Malakisi and sugar factory at Nzoia as well as many service establishments in Bungoma, more agro-based industries and service activities can be established, if the agricultural production further increases.

Bungoma does not seem to have critical development problems other than more common ones shared by most districts such as marketing problems with some agricultural products (e.g. sunflower), decreasing size of land holdings and lack of electricity supply in the interior. Also most roads in the interior are not bitumen paved and some portions (about 100 km) are underutilized due to gullies created by many tributaries of Nzoia River.

Busia

Busia district is constrained by its limited rainfall and soils of low fertility. Out of 163,000 ha of the district land, 63,000 ha are used for agriculture. Main crops are cassava (19,000 ha), maize (7,000 ha), beans (4,000 ha) and sorghum (3,000 ha). Cotton is the important cash crop with a total area of 5,000 ha. Due to low carrying capacity of grassland, livestock production is less developed.

The district's agriculture, however, has been undergoing substantial changes due to implementation of national projects such as the irrigated rice scheme of Bunyala managed by NIB and Yala Swamp Agricultural Development Project conducted by LBDA. These projects contribute not only to increasing crop production but also to improving farming technology and farm inputs in the Region. The provision of seeds of cereals and seedlings of coffee is a typical example.

Lake fishery is another important activity, although the yield is generally low due to small scale operation. The favourable location should be utilized to promote fishery in both Lake and fish ponds and handling/processing of fish from the neighbouring country.

Kakamega

Kakamega district is a densely populated area with the population density of 293 persons/km^2 in 1979, the second highest among all the districts in the Region. Of the total area of 183,000 ha, about 159,000 ha are already actively cultivated. Maize (44,000 ha), beans (23,000 ha) and sorghum (10,000 ha) are main food crops intensively cultivated in the southern part of the district. Cash crop production in the district is represented by sugarcane (33,000 ha) in Mumias, Arabica coffee (1,000 ha), tea (7,000 ha) and horticultural crops (2,000 ha).

The population growth poses a threat to future development of the district, as the pressure on land is already great. Rough terrain and steep slopes especially in the south make the situation even worse. Rural access roads are mostly inadequate. Of all the classified roads (about 1,600 km in total length in 1979), only about 15% is bitumen paved. Together with the problems of producer prices and increasing farm input prices, marketing is a problem particularly for cotton, sunflower and milk.

Elgeyo Marakwet

Out of 281,000 ha of the district land, the western part of 87,000 ha or 31% falls in the LBDA region. The land is characterized in general by rolling to hilly topography. The steepest lands (over 16% gradient) are covered by Kiptaber Forest. The main productive area is the flat terrain extending in the west of Iten, where wheat and maize are cultivated. Dairy production is also prevailing with about 5,000 heads of grade cattle and 9,000 heads of local cattle in 3,000 ha of managed pasture and 2,000 ha of natural grassland. These activities can be intensified, and some expansion of agricultural areas for maize and fodder crops would also be possible.

Kericho

Out of 443,000 ha of the district land, 187,000 ha are used for agriculture. Other than large tea estates, a variety of crops are cultivated by smallholders, covering some 80% of the total cultivated area. Main food crops are maize (42,000 ha) and sugarcane (2,000 ha), and cash crops include tea (26,000 ha) and Arabica coffee (2,000 ha) as well as pyrethrum, fruits and vegetables. The total tea production amounts to 68,000 tons or 54% of the regional production.

Livestock is common throughout the district, with the cattle consisting of about 50 per cent exotic breed and the rest indigenous. Milk production in the district is 156,000 tons, accounting for 31% of the regional production. Zero grazing has been promoted and is picking up. Fishery is also active, although it may not be significant yet. Fish farming is found in most of lower areas, and a fish breeding center for Tilapia has been successfully operated. Trout fish development is also promoted, although at present re-stocking of this species is done with fingerings from outside the Region.

For the major part of district owned by smallholders, the land is already becoming a limiting factor for the further development. This seems particularly true, if generally undulating terrains in the interior are considered. Moreover the southern part of the district suffers from occasional droughts. In these areas, however, irrigation in large scale would be difficult due to the topography. Roads particularly in the interior constitute another major constraint in this predominantly agricultural area. Transportation and marketing problems have been reported especially for milk, horticultural crops and potatoes.

Nakuru

About 67,000 ha or 7% in the western part of the district fall in the LBDA region. South-western Mau Forest covers 27,000 ha or 40% of the total area, constituting the uppermost watershed of Sondu River. Presently about 8,000 ha are used for maize and 4,000 ha for wheat. Dairy cattle raising is prevailing in the district, and the LBDA portion has approximately 15,000 heads of grade cattle and 28,000 heads of local cattle to produce some 11,000 tons of milk and 2,000 tons of meat.

District's development has been centering around the main towns along the trunk road, and the LBDA portion has not been integrated with these areas nor the rest of LBDA region.

This is attributable to the general lack of adequate maintenance of secondary and rural access roads.

Nandi

Out of 275,000 ha of the district land, 104,000 ha are presently used for agriculture. Maize (40,000 ha) and tea (9,000 ha) are the chief food and cash crops, respectively. The tea production is 23,000 tons, accounting for 18% of the total production in the Region. Also sugarcane is cultivated in 3,000 ha in the south of Nandi Hills, constituting the northern fringe of Nyanza sugar belt.

Dairy farming is another important activity in the district. About 29,000 ha of managed pasture and 4,000 ha of fodder crops are developed for 133,000 heads of grade cattle and 75,000 heads of local ones. With the total production of 95,000 tons, the district is a net exporter of milk in the Region.

Immigration from nearby districts such as Kakamega and Kericho has been progressing, which has contributed to relatively high population growth (4.7% annually between 1969 and 1979). Land holding sizes are still relatively large. Probably a major constraint to future development of the district is the availability of human resources. Successful settlement of immigrating people would require the provision of social and economic infrastructure including water, health and education facilities.

Narok

Out of 1,851,000 ha of the district land, 1,049,000 ha or 57% are within the LBDA region, claiming the largest area among all the constituent districts. Agricultural activities in the LBDA portion of the district are less developed. At present, only 42,000 ha are used for food production, mainly maize and sorghum, mostly in the north-west of Esoit-Oloolo escarpment (Kilgoris division).

Local cattle raising is a more important activity than crop production. In total, 592,000 heads of local cattle and 282,000 heads of sheep and goats are grazing in the LBDA portion.

The vastness of the district itself poses a challenge to the development, and infrastructure is generally inadequate and the coverage of social services insufficient. Water supply is insufficient, and grains and potatoes suffer from the lack of sufficient storage facilities and transport problems.

Trans Nzoia

Agriculture, livestock and forestry are all quite active in the district. The main food crop cultivated in the district is maize, and the cash crops include wheat,tea, Arabica coffee, sunflower and pyrethrum. Maize and wheat occupy 66,000 ha. Stock raising is practiced widely on hill slopes covered with volcanic ashes of Mt. Elgon. With 74,000 heads of grade cattle and 36,000 heads of local cattle, 53,000 tons of milk and 3,000 tons of beef are produced. Afforestation is actively carried out, and many nurseries exist, producing

seedlings in excess of 5 million per year. Planting of trees by individual farmers on their own farms has also been encouraged.

Tourism is a potentially important sector with existence of two national parks, viz. Mt. Elgon and Saiwa Swamp, but hampered by lack of adequate infrastructure. Kitale municipality is another important resource, whose main function at present is that of a distribution center for agricultural, livestock and forestry products from its hinterland.

Major constraints to further development of the district seem to be land tenure system and marketing of agricultural and livestock products. The district was formerly a dominantly large-scale farming area but is steadily changing to small holdings. Over 80% of the land has been registered for agricultural use so that the area where projects of direct public investment can be planned in substantial scale may be quite limited and other projects have to be formulated in such a way that is consistent with existing land tenure. Marketing problems affect citrus fruits and other horticultural crops. Except primary roads, most other roads are not even gravelled, causing problems during rainy seasons for transporting agricultural products and milk.

Uasin Gishu

Uasin Gishu is basically an area of rain-fed agriculture. Only one crop is cultivated in a long rain season. Main crops are maize (57,000 ha) and wheat (71,000 ha), producing respectively 158,000 tons and 121,000 tons, accounting for 11% and 78% of the Region's total production. Forestry is second most important rural economy only next to crop cultivation.

Feeding 133,000 heads of grade cattle and 89,000 heads of local cattle, the district produces 95,000 tons of milk and 5,000 tons of beef, corresponding to 19% and 9% of the total production respectively in the Region. The present production is supported by 12,000 ha of managed pasture and 4,000 ha of fodders.

Eldoret municipality is a key factor for the district's development, being a distribution and processing center for agricultural and forestry products. Situated on the main trunk road and having productive agricultural lands in its hinterland, this town is bound to develop continuously, provided that the current severe shortage of water is solved. Other possible constraints include insufficient grain storage facilities and the condition of the trunk road requiring constant repair and proper maintenance.

West Pokot

Out of 898,000 ha of the district land, 25,000 ha or 3% in the south (Kapenguria division) are in the LBDA region. The eastern half of it is covered by Kapkanyar Forest extending to Kiptaber Forest of Elgeyo Marakwet. This forest area forms the uppermost watershed of Nzoia River.

Dairy farming is the most important economic activity in the eastern portion. It is estimated that about 5,000 heads of grade cattle and 9,000 heads of local cattle are raised in 3,000 ha

of managed pasture and 11,000 ha of natural grassland. Also 8,000 ha of the agricultural land are used for crop production, mostly maize and wheat.

Main directions of development would be the increase in milk production and expansion/intensification of food crops production. Major constraints are the lack of storage and processing facilities for agricultural and livestock products and the delay in land adjudication.

Table 2.1 GDP of Kenya by Sector at Current Prices, 1979,1983,1984 and1985

(Unit:K£ 10^6, Shares in Parentheses)

Sector	1979	1983	1984	1985*
Agriculture, Forestry and Fishery	679.0 (34.4%)	1,092.6 (32.9%)	1,152.4 (31.5%)	1,273.4 (30.9%)
Mining and Quarrying	5.0 (0.3%)	7.4 (0.2%)	8.5 (0.2%)	10.0 (0.2%)
Manufacturing	249.8 (12.6%)	408.3 (12.3%)	461.0 (12.6%)	518.4 (12.6%)
Electricity & Water	42.3 (2.1%)	68.9 (2.1%)	76.8 (2.1%)	89.1 (2.2%)
Construction	117.5 (5.9%)	202.7 (6.1%)	218.9 (6.0%)	226.3 (5.5%)
Wholesale & Retail Trade, Hotels & Restaurants	209.2 (10.6%)	381.9 (11.5%)	422.6 (11.6%)	524.7 (12.7%)
Transport & Communication	114.7 (5.8%)	195.3 (5.9%)	235.9 (6.5%)	264.1 (6.4%)
Government Services	290.3 (14.7%)	475.3 (14.3%)	530.6 (14.5%)	601.0 (14.6%)
Other Services	267.2 (13.5%)	484.3 (14.6%)	547.8 (15.0%)	619.2 (15.0%)
Total GDP at Factor Cost	1,975.0	3,316.7	3,654.5	4,126.2

*Provisional
Sources: Statistical Abstract1983
Economic Survey 1986.

Table 2.2 Commodity Composition of External Trade

(1) Changes in commodity composition of external trade (Unit: %)

	1964	1970	1979	1980	1981	1982	1983	1984	1985*
Exports									
Coffee	32.7	21.6	28.7	22.2	21.3	26.5	25.4	26.2	29.7
Tea	12.9	12.8	16.3	17.9	11.9	14.2	19.6	24.4	24.7
Petroleum Products	4.6	13.4	17.7	31.1	30.7	27.4	18.8	17.0	14.0
Others	49.8	52.2	37.3	34.8	36.1	31.9	36.2	32.4	31.6
Imports									
Consumer Goods	30.1	23.2	11.8	10.4	9.8	10.9	13.2	16.1	13.7
Industrial Supplies	34.7	36.0	29.0	27.3	24.9	25.0	27.3	26.4	29.7
Fuel & Lubricants	9.9	9.3	23.7	33.6	38.7	36.9	36.6	30.3	31.4
Machinery, Capital and Transport Equipment	25.3	31.4	35.5	28.7	26.5	27.2	22.5	27.2	25.2

*Provisional
Sources: Development Plan 1984- 88 (1964,1970,1979-81)
Economic Survey 1986 (1982-85)

(2) Exports and imports by commodity in recent years

(Unit: K£10^6)

Exports	1984	1985
Coffee, unroasted	203.5	23.6
Tea	189.5	191.4
Petroleum products	131.6	108.3
Meat and meat products	7.4	6.9
Pyrethrum extract	9.7	9.5
Sisal	12.6	14.4
Hides and skins (undressed)	7.1	10.0
Wattle extract	3.5	3.8
Soda ash	10.4	13.1
Fluorspar	3.4	4.1
Cement	17.5	15.4
Beans, peas, etc.	2.5	0.6
Wool	1.4	0.7
Animal feeds	1.3	0.6
Cotton (raw)	0.1	1.9
Pineapples (canned)	25.9	24.4
Butter and ghee	0.6	0.5
Wood carvings	1.3	1.2
Metal scrap	0.5	0.8
Wattle bark	0.0	0.0
All other items	124.8	137.8
Total	754.8	776.0

Imports	1984	1985
Crude petroleum	292.4	349.3
Industrial machinery (including electrical)	173.6	164.6
Iron and steel	63.0	64.8
Motor vehicles and chassis	55.1	63.8
Petroleum products refined	35.7	27.9
Artificial resins and plastic materials, and cellulose esters and ethers	33.0	37.4
Pharmaceauticals	20.0	23.3
Fertilizers	13.9	52.0
Agricultural machinery and tractors	11.0	13.8
Wheat	20.8	19.1
Paper and paper products	9.4	15.7
Rice	0.1	0.1
Total	1,907.2	1,201.1

Source: Economic Survey 1996

Table 2.3 Current Account Balance

(Unit: K£10^6)

	1964	1969	1979	1980	1981	1982	1983	1984*
Trade Balance	-9.4	-31.6	-299.4	-526.6	-495.4	-430.4	-335.6	-337.0
Net Services	14.4	20.1	79.0	143.2	126.3	140.2	143.5	104.0
Net Transfer	12.5	8.1	34.1	54.7	42.9	36.8	76.5	13.9
Current Account Balance	17.5	-2,4	-186.3	-328.7	-326.2	-253.4	-115.6	-219.1

* Provisinal

Sources: Development Plan 1984-88 (1964,1970,1979-81)
AED, November 1983 (1984)
EIU (1983,1984 Exports)

Table 2.4 GRDP of LBDA Region at Current Prices, 1967, 1976 and 1985

(Unit: K£ 10^3, share in parentheses)

	Year			Real Growth Rate % per Annum	
	1967	1976	1985	'67-'76	'76-'85
Subsistence , and Modern Agriculture	70,724 (72.0%)	189,652 (67.7%)	610,000 (62.9%)	3.5	2.9
Manufacturing and Mining	4,362 (4.4%)	13,904 (5.0%)	75,000 (7.7%)	5.5	9.1
Services	23,153 (23.6%)	76,629 (27.3%)	285,000 (29.4%)	6.0	4.6
GRDP of LBDA Region	98,239	280,185	970,000	4.2	3.8
Share in Kenya's GDP(%)	24.2%	22.4%	23.5%		
Kenya's GDP	405,810	1,253,360	4,126,200	5.1	3.0

Note: Regional data for 1967 and 1976 were calculated from provincial production of Nyanza, Western and Rift Valley Province in source (1), where the portion of Rift Valley provincial production with LBDA region was calculated on the prorated population basis.

Sources: (1) Bigstein, A., Regional Inequality in Kenya," Institute for Development Studies, University of Nairobi, Nov-77
(2) Statistical Abstract 1976 and 1979, and Economic Survey 1986 (GDP)
(3) Study Team's estimate (GRDP in 1985)

Figure 2.1 Problem Structure of LBDA Region

REPUBLIC OF KENYA LAKE BASIN DEVELOPMENT AUTHORITY
THE STUDY OF INTEGRATED REGIONAL DEVELOPMENT MASTER PLAN FOR THE LAKE BASIN DEVELOPMENT AREA
JAPAN INTERNATIONAL COOPERATION AGENCY

CHAPTER 3 DEVELOPMENT STRATEGY, SCENARIOS AND TARGETS

3.1 Basic Development Strategy

The problem structure analysis in subsection 2.1.2 has clarified inter-relationships among various problems facing the Region and identified more fundamental problems. Of them, problems related more to human factors, such as difference in social needs of many ethnic groups and problems with education and public health, can be alleviated through development activities in economic sectors, and the manpower development can in substance be planned in connection with the planning for production activities.

The planning and project implementing capacity in the Region would be most effectively improved through the increase in roles of LBDA. This planning study itself and implementation of development projects formulated by this study would be one of the means for enhancing planning, implementing and managing capability of LBDA.

Other than these problems, the following are fundamental problems which can be more directly dealt with in this planning study.

(1) Uneven distribution of water resources,
(2) Paucity of exploitable energy resources, and
(3) Under-utilization of land and problems with land tenure systems.

The first problem above calls for proper management of water resources, which can also contribute to coping with the second problem through hydropower development. Watershed management is another aspect related to the energy problem through the enhancement of forest resources. Another way of alleviating these natural and thus inherent problems is to improve the provision of other infrastructure and utility facilities in order to increase land-, water- and energy-productivity.

Thus the basic strategy for the Region's development is drawn up as follows.

(1) To develop and control water resources for primary production activities as well as for improving sanitation of people so that development potentials in different areas of the Region can be realized based on indigenous resources in respective areas;

(2) To improve the provision of infrastructure for agriculture and related economic activities such as agro-related industries; and

(3) To rationalize land use first by intensifying cultivation in existing agricultural lands and second by expanding the agricultural area in accordance with land suitability as well as existing land tenure systems.

In addition, the following strategies will help to further increase the comparative advantages of the Region for industrial location and to rectify disparity with other regions: i.e.

- to develop human resources to meet increasing requirements of higher technologies and wider expertises.

3.2 Development Scenarios

Alternative development scenarios are presented below. Each of them describes in general terms the main direction of development, roles and functions of the Region.

(1) Scenario 1: Granary

The Region should increase food crop production as much as possible, aiming at making it a granary of Kenya or even East Africa as a whole. Maize and rice are considered more important strategic crops, and increase in milk production is also emphasized.

(2) Scenario 2: Agro-industrial base

The Region should make maximum contribution to foreign exchange earnings/savings first by diversifying/intensifying cash crops and then also by promoting agro-industries and those crops providing inputs to them. Strategic crops include tea, coffee (Robusta as well as Arabica), cotton, sugarcane, horticultural crops and oil crops. They will induce the agro-processing industries of various kinds, and other agro-related industries will also be induced in a longer run.

(3) Scenario 3: Intermediate path

The Region should be developed by making use of complementary aspects of Scenario 1 and Scenario 2 with functional divisions among districts, major towns and rural/urban areas. Some districts may be specialized in a certain strategic crop, and some towns may be equipped with higher order service functions such as communication/conference and education/technology development.

Scenarios 1 and 2 provide guiding principles for the development along the two distinct paths. It is expected that the Region's development would follow the line indicated by Scenario 1 for the coming several years, and then shift gradually toward what would be indicated by Scenario 2, if the present conditions and the gestation period required to establish more cash crops and agro-industries are considered. The development plan will be worked out for this intermediate path as the best and most practicable scenario after the macroframes of the other two are analyzed. This intermediate path will be described in more detail by clarifying development phasing (subsection 4.3.2.).

3.3 Development Targets

3.3.1 Socio-economic projections

(1) General

Various socio-economic indices are projected to the year 2005 to set a framework for planning, in such a way that projected figures are consistent to one another. Indices used in this planning study are GRDP and its sector breakdown, per capita GRDP, rural and urban population and employment.

The projections consist of a trend projection and scenario projections. The trend projection represents what the socio-economy of the Region is likely to be in 2005, if things go as they have been. It is made on the basis of the past performance of Region's socio-economy, characterization of the Region and its position in national economy, and resource endowments and development potentials, as analyzed mostly in Chapter 2. Scenario projections are conducted for alternative development scenarios by setting strategy and targets in such a way that is consistent in macroscopic aspects with the basic concepts of respective scenarios.

(2) Trend projection

Population

1) Population in 1985

The population by district in 1985 was taken from the official projection, as the lowest projection done in 1979 for Kenya seems to agree with what had realized at least up to 1985(CBS, Population Projections for Kenya 1980-2000, March 1983). Population of those districts which partially fall in the LBDA region was calculated from the population by district in ILUS study, assuming for each district the ratio of population in the LBDA portion to the total district population has not changed.

2) Growth rates for 1985-2005

Average annual growth rates in the past were taken as the basis, and slightly lower growth rates than in the past for 1985-2005 were assumed for each Province or district in view of the expected decrease in fertility and increasing pressure on land (see Table 3.1). Since there are some inconsistencies in the past census results as pointed out by CBS, the population by district in 1979 was obtained by adjusting the census results and the average annual growth rate for 1979-85 was calculated by district and by province.

3) Projection to 2005

The total population by Province in 2005 was calculated by applying the growth rates determined as above. The district population was first estimated separately by assuming the average annual growth rate for each district just as done for provinces. It is then adjusted by

multiplying the projected district population by the ratio of the total provincial population to the sum of the projected district population.

The results are summarized in Table 3.1. The table also shows the total population of Kenya. It is assumed that the Kenya's population will grow at an average annual rate of 3.7% to the year 2000 as stipulated in SP1 and at 3.5% thereafter to make the overall average rate 3.6% per annum for 1985-2005. The Region's population may grow at a lower rate of 3.3% per annum due to significant and increasing out-migration, although the natural growth rates are much higher (about 3.9% per annum).

Economy

1) GRDP in 1985

The GRDP of the Region was estimated from the data for the 1967-76 period, as described in Chapter 2. The sector GRDP was estimated for main sectors : viz. subsistence and modern agriculture, including livestock, forestry, fishery and rural off-farm activities, and manufacturing and mining. Results are shown in Table 2.4.

2) Growth rates for 1985 - 2000

Average annual growth rates of the GRDP and the sector GRDP of the two production sectors i.e. subsistence and modern agriculture, and manufacturing and mining were assumed to be 3.6%, 3.3% and 5.0% respectively for the period 1985-2000.

3) Projection to 2005

The total GRDP and value-added in the two production sectors were calculated by applying the growth rates assumed as mentioned above. The GRDP in services sector was calculated as the balance between the projected total GRDP and the value-added in the other two sectors.

(3) Scenario projections

Conditions for projections

In scenario projections, targets are set for selected socio-economic indices in accordance with the basic concepts of each scenario, and other indices are estimated in a way consistent with the targets. The scenario projections in this planning study are made on the basis of the following conditions, consistent with the regional development objectives.

First, the targets are set with respect to per capita GRDP. Specifically, such a growth rate of per capita GRDP that is higher than the average growth of per capita GDP of Kenya is aimed at, in view of the development objective of narrowing the income disparity between the Region and Kenya as a whole.

Second, the growth of agricultural sector is estimated, in line with the objectives of maximizing agricultural production and contributing to nation's food security. Assumptions have been made on crop yields that the level III production targets will be generally attained in 2005 by use of high yielding varieties, proper application of agricultural inputs and improvement of farming practice (MOALD, Farm Management Handbook). As measures to ensure the attainment of the targets, the Master Plan proposes extension programmes, farm input supply, agricultural credit, research for improved varieties, farm machinery services and other supporting systems (Section 1.3, Sector Report).

Specific figures for crop yields at present and in future used in estimating production have been adopted from the data of MOALD. Average yield of maize in 2005 has been calculated to be 4.6 tons/ha as a weighted average of yield by agro-ecological zone by district and by season. The yield of beans is estimated to be 0.7 ton/ha for 1985 and 1.2 tons/ha for 2005 based on the past performance in the Region, and the yield of Robusta coffee in 2005 is assumed to be 0.7 ton/ha according to SP1. The value-added per ha of maize, wheat, barley, oat, beans, Arabica coffee, Robusta coffee and tea are estimated by applying the assumed crop yields to the data on prices and input requirements of the crops collected for the Region. The value-added per ha for other crops are taken from SP1.

Third, the growth of manufacturing sector is estimated on the basis of enhancement of Region's agricultural base under each scenario, as it will be led by agro-based industries. The value-added of those industries to be newly introduced or much enhanced are separately estimated by analyzing the development schedule based on inputs availability, market prospects and other conditions (Section 4.5, Sector Report). The value-added in the services sector is calculated based on the past relationship between the ratio of this sector to the manufacturing sector and the share of the latter in GRDP.

Fourth , the number of employment opportunities to be generated is calculated from the labour requirement by sector, which is estimated from the sector GRDP and the unit value-added per person employed in each sector. The latter, called employment coefficient, is determined based on the past relationship between production and employment in each sector and assumed increase in labour productivity (subsection 4.3.1).

Examination of results

The results of the trend projection shown in the third column of Table 3.2 indicate that the per capita GRDP will not increase in any appreciable degree despite the slower population growth. The results of projections for Scenarios 1 and 2 summarized in fourth and fifth column of Table 3.2 show substantial improvement as described below.

With the view to narrowing the income disparity between the Region and the whole of Kenya, the growth rate of GRDP per capita was set at 2.2%, which is higher than the national target of 1.8%. Accordingly GRDP per capita of K£120, or 59% of national average of K£204 in 1985 will increase to K£185, or 62% of national average of K£297 by 2005 under both scenarios.

If only the vertical expansion on the already cultivated area of 1,549,000 ha were depended on, the value-added of subsistence and modern agriculture sector would increase at a growth

rate of only 3.0%, significantly lower than the national target of 5%. A horizontal expansion of agricultural production is envisaged for the development of grassland of 565,000 ha for food crops and fodder crops under Scenario 1 and 343,000 ha for cash crops and fodder crops under Scenario 2. With such expansion, the value-added in the sector will increase from K£610 million in 1985 to K£1,632 million at a growth rate of 5.0% under Scenario 1 and to K£1,777 million at a growth rate of 5.5% under Scenario 2 by 2005, increasing the share of agriculture sector in the whole of Kenya. The Region will be self-sufficient in most major crops, but share in national food crop production will decrease if Scenario 2 is employed (national production target for 2005 is assumed to be 5,550,000 tons for maize 600,000 tons for wheat, 337,000 tons for tea and 9,360,000 tons for sugarcane).

Value-added of manufacturing and mining sector will increase from K£75 million in 1985 to K£303 million at a growth rate of 7.2% under Scenario 1 and to K£357 million at a growth rate of 8.1% under Scenario 2 by 2005, while the average growth rate as the national target is 7.2%. The share of the sector in GRDP of 7.7% in 1985 will increase to 10.3% under Scenario 1 and 11.4% under scenario 2 by 2005.

GRDP will increase from K£970 million in 1985 to K£2,880 million at a growth rate of 5.6% under Scenario 1 and to K£3,190 million at a growth rate of 6.1% under Scenario 2 by 2005, while GDP growth rate as national target is 5.6%.

Sustainable population will be determined by the size of GRDP. Population in the Region of 8.1 million in 1985 will increase to 15.6 million at a growth rate of 3.3% under Scenario 1, and to 17.0 million at a growth rate of 3.8% under Scenario 2 by 2005, while the national average growth rate is expected to be 3.6% for 1985-2005. During the same period urbanization ratio will increase from 7.8% to 12.5% in the Region.

Employment opportunities in terms of labor requirement will increase from 2.5 million in 1985 to 5.8 million under Scenario 1 and to 6.3 million under Scenario 2 by 2005, corresponding to an improvement in unemployment ratio from 17% to 9% under Scenario 1 and to 10% under Scenario 2.

3.3.2 Recommended framework

Based on the results of the examination of frameworks for Scenarios 1 and 2, a framework for Scenario 3 is herein recommended to be taken up , which sets the socio-economic targets to be attained by 2005. The integrated regional development master plan will be hereinafter formulated based on this framework. The recommended framework for Scenario 3 is featured by the right column of Table 3.2.

The target GRDP per capita of K£185 assumed for both Scenarios 1 and 2 is applied for Scenario 3, because it is evaluated to be appropriate to narrow the income disparity between the Region and the whole of Kenya.

In principle, Scenario 1 should be selected in order to sustain Region's contribution to nation's food self-sufficiency especially in maize, but Scenario 2 would be preferable in view of increased share of Region's agriculture in national economy as well as larger

sustainable population. Under Scenario 2, however, the share in national food crop production will decrease. Therefore, the best compromise should be sought between these two scenarios to establish a recommended framework.

The major difference between alternative scenarios or frameworks is in the land development for agriculture (horizontal expansion), since the vertical expansion would be realized by maintaining in principle the existing cropping patterns under any scenario. Therefore, the cropping patterns for expansion areas have been accordingly scrutinized in more detail with the following three criteria; (1) agricultural land development would be conducted where a high yield of either food crop or cash crop would be expected, (2) cash crops would be given a priority to food crops on the expansion area, and (3) cropping pattern on expansion area would be adjusted to a predominant crop in surrounding area (details in Chapter 10, Sector Report). The expansion of food crop area under Scenario 3 aims at maintaining the present share in national production of different food crops, and thus 345,000 ha have been allocated to food crops as detailed in Table 3.3. The expansion of fodder crop production aims at the regional self-sufficiency of milk, and for this 100,000 ha have been allocated. Cash crops should be expanded in 120,000 ha to make the total expansion area 565,000 ha (subsection 10.4.1, Sector Report). The value-added of subsistence and modern agricultural sector under Scenario 3 will increase to K£1,752 million at a growth rate of 5.4% by 2005. Proposed land use in agricultural expansion area by scenario is summarized in Table 3.3.

Value-added of manufacturing and mining sector as well as service sector were adjusted, according to the above mentioned modifications in subsistence and modern agricultural sector. The value-added of manufacturing and mining sector will increase to K£ 324 million at a growth rate of 7.6% and that of service sector will grow to K£ 1,004 million at a growth rate of 6.5% by 2005 under Scenario 3. Estimated value-added by sector/subsector is summarized in Table 3.4.

GRDP will increase to K£ 3,090 million at a growth rate of 5.9% and population will grow to 16.7 million at a growth rate of 3.7% by 2005 under Scenario 3. GRDP growth rate will be significantly higher than that of GDP. Population growth rate will be slightly higher than the national average.

Employment opportunity will be 6.2 million in 2005 corresponding to an unemployment ratio of 10%. Projected population of the Region is given in Table 3.5 with age-sex distribution and labour force.

3.4 Development Strategy by District

Basic development strategy by district is articulated in this subsection based on the examination of development potential and problems described in Sections 2.1 and 2.3, broadly in line with the basic strategy for the Region.

Kisii

- To intensify land use by rehabilitating coffee and tea areas, introducing more zero-grazing units, establishing larger fish farms especially in marshy areas, utilizing valley bottoms for cultivation, and introducing agro-processing industries.

Kisumu

- To provide adequate infrastructure including irrigation and drainage in order to overcome the unfavourable conditions such as extremely heavy soil and relatively low rainfall, while properly dealing with the existing land tenure dominated by smallholders; and

- To develop Kisumu municipality in a longer run with higher order service functions such as conference/communication and education/technology development in order to attract more people.

Siaya

- To enhance people's standard of living by meeting more immediate requirements such as increase in food production and improved water supply to rural areas; and

- To strengthen economic structure by establishing another major cash crop (e.g. Robusta coffee and cotton), revitalizing the fishery sector with the provision of cold storage and processing facilities, and improving the livestock sector.

South Nyanza

- To provide an improved transportation network connecting selected strategic areas and towns such as Migori, Rongo, Karungu and Homa Bay in order to assist existing economic activities and to facilitate the expansion of agricultural land and the establishment of new activities; and

- To improve watershed management for controlling floods, enhancing land productivity by agro-forestry and irrigation, and expanding water supply to smaller towns and rural areas.

Bungoma

- To improve access from the central corridor of the national trunk road A104 in order to induce the agricultural development in the interior and the establishment of agro-processing industries along the corridor; and

- To further diversify its economy in a longer run by expanding farmland and introducing more cash crops, establishing fish culture for Tilapia and brown trout and encouraging tourism in Mt. Elgon area.

Busia

- To strengthen economic structure by reclamation and crop diversification and development of livestock and fishery, while securing marketing channels by improving access roads and other facilities and institutions.

Kakamega

- To improve the provision of infrastructure and utilities, especially rural access roads and electricity in order to promote agro-industries in rural areas and to encourage milk production by zero-grazing and dairy processing.

Elgeyo Marakwet

- To integrate production activities such as wheat and maize production and dairy farming with forest conservation and watershed management by proper allocation of land; and

- To contribute in a longer run to the integration of tourism and other activities in Kerio Valley with the rest of LBDA region by providing better accommodations and road connections.

Kericho

- To increase the production of tea and coffee by rehabilitation/expansion; and

- To integrate fishery, livestock and tourism with crop cultivation for intensifying land use by means of the provision of such infrastructure as small dams, a network of access roads and tourism facilities.

Nakuru

- To contribute to the proper functional division between the LBDA region and the whole district by watershed management to serve the LBDA region, increased agricultural and livestock production to supply the whole district and better road links for both regions.

Nandi

- To improve the provision of social and economic infrastructure such as water, power, health and education facilities in order to attract more people to promote existing economic activities of various kinds.

Narok

- To improve road networks, water supply and storage facilities with the view to expanding and intensifying food and milk production in and around the existing agricultural areas; and

- To provide basic infrastructure in other areas and to conserve Trans Mara Forest and Mara River watershed to protect Masai Mara game reserve.

Trans Nzoia

- To improve access roads to facilitate marketing of agricultural and livestock products and to encourage full utilization of existing facilities for livestock development; and

- To integrate production activities and watershed management of upper catchment area of Nzoia River by agro-forestry such as expansion of Arabica coffee and cultivation of citrus fruits and soil conservation measures including terracing of farm lands, afforestation and river-bank protection.

Uasin Gishu

- To increase production of maize and wheat by intensification and expansion and to diversify crops in combination with rehabilitation/construction of dams for irrigation with the view to inducing processing industries in and around Eldoret; and

- To make Eldoret to continue to lead the district's development by removing existing bottlenecks of water supply, grain storage facilities and other infrastructure.

West Pokot

- To integrate production activities such as maize and wheat production and dairy farming with forest conservation and watershed management by proper allocation of land; and

- To improve marketing channels to and from Trans Nzoia by establishing functional division and providing better-storage and marketing facilities.

Table 3.1 Population and Growth Rates in LBDA Region and Trend Projection

(Unit : 10^3)

	1979*	1985**	Growth Rate 1979-85	Projected Population 2005***	
Western Province	1,905	2,355	3.6	4,414	(3.2)
Bungoma	530	658	3.7	1260	
Busia	300	391	4.3	840	
Kakamega	1,075	1,306	3.3	2,314	
Nyanza Province	2,940	3,632	3.6	6,819	(3.2)
Kisii	965	1206	3.8	2,428	
Kisumu	540	656	3.2	1,176	
Siaya	540	651	3.2	1,167	
S. Nyanza	895	1,120	3.8	2,047	
Rift Valley Province	1,680	2,129	4	4,314	(3.6)
Kericho	580	699	3.2	1,186	
Nandi	340	434	4.2	893	
Narok	60	78	4.5	170	
Trans Nzoia	270	366	5.2	912	
Uasin Gisu	300	393	4.6	873	
Others	130	159	3.4	280	
LBDA Region	6,525	8,116	3.7	15,547	(3.3)
Kenya	16,100	20,240	3.9	41,331†	(3.6)

Notes * : Adjusted population based on the census results
** : Adopted from source (2) below
*** : Growth rate 1985-2005 in parentheses
† : Official projection for 2000 extrapolated to 2005

Sources: (1) ILUS
(2) Population Projections for Kenya 1980-2000, March 1983

Table 3.2 Projections of Socio-Economy in LBDA Region for 2005

	1985	Trend Projection	Scenario Projection		
			Scenario 1	Scenario 2	Scenario 3
Per Capita GRDP K£	120	126 (0.2)	185 (2.2)	185 (2.2)	185 (2.2)
GRDP-Total K£x10^6	970	1,968 (3.6)	2,880 (5.6)	3,190 (6.1)	3,090 (5.9)
Subsistence and Modern Agriculture	610	1,168 (3.3)	1,632 (5.0)	1,777 (5.5)	1,752 (5.4)
Manufacturing and Mining	75	199 (5.0)	303 (7.2)	357 (8.1)	324 (7.6)
Services	285	601 (3.8)	945 (6.2)	1,056 (6.8)	1,014 (6.5)
Population-Total 10^3	8,116	15,547 (3.3)	15,600 (3.3)	17,000 (3.8)	16,700 (3.7)
Urban	633	1,700 (5.1)	1,900 (5.6)	2,200 (6.2)	2,200 (6.2)
Rural	7,483	13,900 (3.1)	13,700 (3.1)	14,800 (3.5)	14,500 (3.4)
Employmenr opportunities 10^3	2,500	4,900 (3.4)	5,800 (4.3)	6,300 (4.7)	6,200 (4.6)
Agricultural land area 10^3 ha	1,549	1,642 (0.3)	2,114 (1.6)	1,892 (1.0)	2,114 (1.6)
Share in assumed national production (%)					
Maize	72	48	78	45	73
Wheat	76	61	117	58	86
Tea	66	59	56	95	85
Sugarcane	98	85	80	99	99

Notes: Average annual growth rates are in parentheses.
Projections were made by JICA Study Team as described in the text.

Table 3.3 Agricultural Land Development Plan by Scenario

(Unit: 1,000 ha)

	Scenario 1	Scenario 2	Scenario 3
Food crops			
Maize	235	0	206
Sorghum & Milk	25	0	25
Beans	49	0	43
Wheat	98	0	44
Rice	27	15	27
Root crops	24	0	0
Others	0	0	0
Sub-total	458	15	345
Cash crops			
Arabica coffee	0	27	17
Robusta coffee	0	40	32
Tea	0	32	24
Cotton	0	10	7
Sugarcane	0	25	25
Others	0	30	0
Sub-total	0	164	105
Fruits & Vegetables			
Fruits	0	40	10
Vegetable	0	17	5
Sub-total	0	57	15
Fodder	107	107	100
Managed Pasture	0	0	0
Fallow	0	0	0
Total	565	343	565

Note: Prepared by JICA Study Team as reported in Chapter 10, Sector Report.

Table 3.4 Estimated Value Added by Sector/Subsector, 1985 and 2005

(1) Agriculture, livestock, fishery and forestry

	1985				Master Plan (2005)			
	Cultivated Area 10^3 ha	Crop Area 10^3 ha	Production 10^3 ton	Value-added K£ 10^6	Cultivated Area 10^3 ha	Crop Area 10^3 ha	Production 10^3 ton	Value-added K£ 10^6
1. FOOD CROPS								
Maize	455	537	1,504	157	661	886	4,078	348
Sorghum & Millet	58	67	54	2	83	111	189	9
Beans	91	110	77	12	134	180	215	48
Wheat, Barley & Oat	92	92	156	6	136	136	517	40
Rice	3	3	8	1	30	30	150	21
Root Crops	92	92	693	22	92	92	1,490	48
Others	31	31	279	1	31	31	279	1
Sub-total (1)	822	932		201	1,178	1,466		515
2. CASH CROPS								
Arabica Coffee	13	13	5	9	30	30	51	79
Robusta Coffee				0	32	32	23	33
Tea	48	48	125	41	72	72	288	125
Cotton	49	49	15	3	56	56	45	9
Sugarcane	109	109	3,488	43	134	134	9,246	117
Others	16	21	25	3	16	21	38	12
Sub-total (2)	235	240		99	340	345		375
3. FRUITS & VEGETABLE								
Fruits total	10	10	56	4	20	20	402	23
Vegetable total	3	3	17	3	8	8	161	33
Sub-total (3)	13	13	73	7	28	28	563	55
TOTAL (1+2+3)	1,070	1185		307	1,551	1839		946
4. LIVESTOCK								
Milk			508	44			1,661	145
Meat								
Beef			56	2			71	4
Pork			1	0			9	1
Chicken			6	0			17	9
Sheep & Goats			9	1			9	1
Sub-total (VI.2)			72	3			106	15
TOTAL LIVESTOCK PRODUCTION (4)				47				160
5. FISHERY			88	10			115	37
6. ACTIVITIES IN MARA RIVER BASIN								
Crop Production			20	1			20	1
Livestock Production				8				12
Sub-total (6)				9				13
7. RURAL OFF-FARM				222				553
8. FORESTRY				15				43
TOTAL (1 to 8)				610				1,752
ANNUAL GROWTH RATE (%)								5.4%

Table 3.4 Estimated Value Added by Sector/Subsector, 1985 and 2005

(2) Manufacturihg sector

	Value-added (K£ 10^3) 1985	2005	Growth Rate per Annum %
All the existing industries	71.5	204.1	5.4
Introduced/enhanced industries	-	103.4	-
Edible oil		17.0	
Canned fruit		0.7	
Fish fillet and fish oil etc.		6.3	
Instant coffee		34.1	
Animal and fish feeds		8.3	
Cotton products		1.8	
Hides and skins		8.9	
Briquets		negligible	
Pulp and paper		1.8	
Printing		0.7	
Power alcohol		4.0	
Ceramic products		1.0	
Cement		1.2	
Machinery and metal works		13.4	
Packing materials		4.2	
Informal sector industries	3.7	16.4	7.7
Total	75.2	323.9	7.6

Note: Estimated by JICA Study Team as described in Chapter 4, Sector Report.

Table 3.5 Pojected Population of LBDA Region with Age-Sex Distribution and Labour Force, 2005

Unit 10^3

1. Projected population

Age group	Male	Female	Total
0-4	1,520	1,510	3,030
5-9	1,220	1,220	2,440
10-14	1,040	1,050	2,090
15-19	870	880	1,750
20-24	760	760	1,520
25-29	680	670	1,350
30-34	570	550	1,120
35-39	440	440	880
40-44	290	320	610
45-49	220	240	460
50-54	170	190	360
55-59	140	160	300
60-64	110	130	240
65-69	90	110	200
70-74	70	70	140
75+	100	90	190
Total	8,290	8,390	16,680

2. Labour force

		Share in total population
Population in age group 15-59	8,350	50.1%
Labour force (Assuming the participation rate of 82%)	6,850	41.1%

Note : Projections made by JICA Study Team

CHAPTER 4 DEVELOPMENT PLAN

4.1 Spatial System

4.1.1 Spatial development framework

(1) Spatial development policies

The Kenyan Government has been placing increasing emphasis on rural-urban balance in the Country's socio-economic performance, as further stressed by Sessional Paper No. 1 of 1986. The paper has clarified that the basic idea of rural-urban balance is to promote the development of an urban system that supports the development of agriculture and rural areas, generating employment opportunities close to where rural workers already live.

Main objectives set by the sessional paper of rural-urban balance are:

(i) to avoid the excessive concentration of population in Kenya's largest cities,
(ii) to promote vigorous growth of secondary towns and smaller urban settlements,
(iii) to foster productive linkages between agriculture and other sectors, between rural areas and local service centers, market towns, gateway towns and secondary cities, and
(iv) to bring renewed economic growth to all regions so that even the least developed regions can share in the general growth of the economy.

Effective measures to attain these objectives are among others to improve the provision of infrastructure and utilities to selected strategic areas. The sessional paper emphasizes the following.

(1) To broaden the central Mombasa-Nairobi-Uganda corridor, the Government will upgrade a few existing highways connecting secondary towns with superior growth potential.

(2) To stimulate economic exchange between productive rural areas and small towns, rural roads will be improved where they are likely to enable such towns to grow into distribution and marketing centers.

(3) To relieve bottlenecks to future growth, water supplies will be expanded in larger towns that have development potential but foresee deficiencies in current supply.

(4) Sewage treatment and storm water drainage systems will be constructed in larger towns where the costs of recycling water are lower than construction of pipelines to distant supply sources.

Other measures emphasized by the paper include the timely provision of urban land for industrial, commercial and other purposes, and measures related to housing development as well as finances for promoting urban and industrial development.

As an important policy instrument to realize better rural-urban balance, SP1 has announced the designation of selected small towns as Rural Trade and Production Centers (RTPC's), where a range of basic physical infrastructure and facilities will be strategically provided to support agriculture and other production, employment generating activities. According to SP1, a RTPC will be an existing town or village with a 1979 population below 5,000, and by the year 2000, a total of about 200 such centers will be encompassed by this program.

(2) Spatial development potential

Population distribution and population centers

Variation in population density within the Region reflects more the difference in population distribution in rural areas due to difference in land productivity for agriculture rather than the degree of urbanization. Each urban center, being primarily a service center for respective rural hinterland, does not have sufficient capacity to attract and assimilate people from the hinterlands. Thus most people moving out of the rural areas in search of better employment opportunities find their ways to outside the Region. Some districts in the Region, such as Nandi, Uasin Gishu and Trans Nzoia, are receiving areas of migrating population, but this represents mostly rural to rural migration and is not due to assimilative capacity of any urban centers. Thus it is essential first to enhance the capacity and functions of larger urban centers.

Second, functions of smaller urban centers and rural centers to serve respective rural hinterlands have to be improved. The LBDA region had 29 urban centers and 59 rural centers in 1979. Excluding larger ones having a 1979 population of more than 5,000, the total number of these centers becomes 76. All of them will be eligible as RTPC's, since about 80 RTPC's should be identified in the Region out of the total 200 to be designated by the year 2000. These prospective RTPC's would certainly constitute the basis for enhancing services for production activities and income levels in rural areas. Thus these centers should be taken into account together with other major urban centers in assessing spatial development potentials of the Region.

Assessment of spatial development potential

Accessibility to urban services is an important factor in determining development potentials. This is measured by distance from urban and rural centers, including all the prospective RTPC's , and major transportation infrastructure. Specifically the areas satisfying any one of the following criteria are considered of high potential with this respect.

	Criteria
Transportation network:	
A104, A1, and B1 from the east up to Kisumu	5.0 km road-side
Other major roads	2.5 km road-side
Catchment area of urban services:	
Municipality	20 km radius
Urban center	8 km radius
Rural center	4 km radius

To be overlaid on this evaluation is general prospect of water availability, which was found to be another important factor prescribing the distribution of population in the Region. For this, the results of water demand - supply balance are used, which examined the availability of both surface water and groundwater by sub-catchment in meeting the projected water demand for domestic, industrial and irrigation purposes in both rural and urban areas (Section 7.3, Sector Report). Those sub-catchment which would require no major storage to meet the demand by 2005 are considered of high potential with this respect.

Another natural factor taken into account is forest reserves. No development is considered within the areas of existing forest reserves.

Results and implications to development

By using the accessibility to urban services and water availability as criteria, two-way classification of lands can be made with respect to spatial development potentials as illustrated in Figure 4.1. Four different kinds of zones are thus broadly identified. Implications to development of each zone thus classified may be as follows.

Zone 1: (high accessibility to urban services; high water availability). Agricultural development can be promoted intensively, if soil and other natural conditions allow; otherwise more urbanization/industrialization should be considered.

Zone 2: (high accessibility to urban services; low water availability). Judgement has to be made as to whether to accelerate water resources development and urban water supply, including trans-basin diversion or rather to encourage less water-intensive development.

Zone 3: (Low accessibility to urban services; high water availability). Improved transportation infrastructure should be provided to support agriculture and/or agro-industries with associated activities.

Zone 4: (low accessibility to urban services; low water availability). Low priority is accorded to the development, except the provision of basic needs, unless other natural conditions are found superb.

Identification of potential development areas

From Figure 4.1, the following major areas may be identified, representing each of three relatively high potential zones (except Zone 4).

Zone 1:

(a) Area between the national trunk road A104 and Kisumu municipality, including Kakamega municipality, Mumias and Butere
(b) Area connecting Londiani, Kericho and Sotik (gateway area)

Zone 2:

(a) Lake shore area centering around Kisumu municipality including Kano Plain
(b) Area connecting Kisii, Rongo, Migori and Homa Bay
(c) Area around Eldoret
(d) Area around Kitale

Zone 3:

(a) Most part of Busia
(b) Western part of Bungoma
(c) North-eastern corner area covering parts of West Pokot, Trans Nzoia and Elgeyo Marakwet districts
(d) Hinterland area of Zone 1 area (b)

(3) Spatial development strategy

The foregoing analyses dictate that the basic strategy for the Region's spatial development should be to improve the provision of infrastructure and utilities to those areas identified above to be of high potential, aiming at inducing the development of respective hinterlands. Combining those strategic areas, more specific strategies may be presented as follows:

(i) Consolidation of East-West corridor;
(ii) Establishment of North-South axis; and
(iii) Enhancement of the development core area

The strategy (i) reflects the idea that higher returns on investment can be expected in such an area where there already exists certain accumulation of economic activities, being served by better infrastructure and utilities. Zone 1 area (a) and Zone 2 area (c) are just such areas. As compared with the east-west communication, the north-south axis has not been well established in the Region, as the northern peripheries and the southern interior are less developed. The strategy (ii) is meant to remedy such a situation, capitalizing on the potential of Zone 2 areas (b) and (d) and Zone 3 area (c). It will also contribute to the development of Zone 3 areas (a) and (b). The development of Zone 2 area (b) will be aided by the development of gateway area: i.e. Zone 1 area (b) and Zone 3 area (d).

The area generally north of the Kisumu municipality and bordered by the national trunk road A104,: i.e Zone 1 area (a), may be regarded as a core of the development in the Region, with the population and economic activities most heavily concentrated. Over 25% of the Region's total population live in this area of some 100 km diameter. Further development of this area with the strategy (iii) would help to attract more people drifting out from rural areas who would otherwise find their ways to outside the Region. Particularly assimilative capacity of Kisumu and Eldoret municipalities should be enhanced. The development of the neighbouring areas, especially the Lake shore area and Kano Plain, i.e. Zone 2 area (a), should be treated in relation to this core area.