



**LEGEND**

Mapping Symbol	Suitability Class
	S1
	S2
	S3

- Note : 1. Land suitability classes are indicated by the following symbols :  
 S1 - highly suitable,  
 S2 - moderately suitable,  
 S3 - marginally suitable and  
 N2 - unsuitable.
2. Limitations are indicated by the following letter suffixes ;  
 s - soil (effective depth, texture, alkalinity and salinity),  
 t - topography (slope and microrelief) and  
 d - drainage conditions.

REPUBLIC OF KENYA  
 LAKE BASIN DEVELOPMENT AUTHORITY  
 KANO PLAIN IRRIGATION PROJECT

**Land Classification Map (upland)**

JAPAN INTERNATIONAL COOPERATION AGENCY



***Annex IV***

***Socio-Economy***



Feasibility Study  
on  
Kano Plain Irrigation Project

Annex IV  
Socio-Economy

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## 1. INTRODUCTION

This is a supporting report of the Feasibility Study on the Kano Plain Irrigation Project.

This report describes the national and regional background of the project and the socio-economic aspects of the project area based on the data and information collected during the study. The socio-economic aspects presented here includes the local government administration, population, land category status and social infrastructures. However, data and information available for the study are limited, and some of the items are able to describe only at District levels.

## 2. NATIONAL BACKGROUND

### 2.1 Land and Population

#### 2.1.1 Land

Kenya is located in the equatorial zone of the eastern Africa and occupies its territory of about 583,000 km<sup>2</sup>, of which about 572,000 km<sup>2</sup> (98%) is dry land and 11,000 km<sup>2</sup> (2%) is open waters. The country exhibits a considerable climatic variation from the humid and hot in coastal to the dry and cool in highlands.

About four fifth of the land or about 473,000 km<sup>2</sup> is classified into arid or semi-arid area. Only about 18% of the land or about 105,000 km<sup>2</sup> is classified into medium and high potential arable lands. Most of the arable land is utilized for agricultural production. Of the remaining land, about 36,000 km<sup>2</sup> have been reserved for wildlife conservation, while only about 2,000 km<sup>2</sup> are left to natural and exotic plantation forests.

#### 2.1.2 Population

Population of Kenya shows the high growth rate at more than 3% since 1948, at the time of the first Population Census. Average annual growth rate during 1970s was estimated at 3.8% but growth rate becomes lower at 3.3% for 1979 to 1989.

According to the Population Census 1989, the total population of Kenya is estimated at 21.4 million, consisting of 3.7 million (17%) in urban area and 17.7 million (83%) in rural area. This figure is 9% below the projected population of 23.5 million based on the Census 1979. This might be caused by the declines of fertilities. The population density is also estimated at 36.7 persons/km<sup>2</sup>.

Although the future population is projected for the year of 2000 to be 38.5 million at the annual growth rate of 4.3% on the basis of Population Census 1979, the projection would be adjusted to lower figure using the latest data of Census 1989 .

### 2.2 National Economy

#### 2.2.1 General

The agriculture sector plays dominant role in the national economy, sharing about 30% in the gross domestic products and contributing almost 60% of the export earning. Furthermore, this sector provide the largest employment opportunity out of all the sector and produce foodstuff to the people and supply raw material for industrial sector.

## 2.2.2 Gross Domestic Products (GDP)

Growth of the Kenyan economy in terms of GDP is divided in some stages since its independence in 1964 as follows.

Year	Growth Rate (%)	Year	Growth Rate (%)
1964 to 69	5.8	1980	3.3
1970	6.8	81	5.3
71	7.0	82	1.5
72	6.8	83	0.7
73	4.3	84	4.9
74	1.1	85	5.9
75	4.1	86	4.9
76	2.4	88	5.2
77	8.8	89	5.0
78	6.6	90	4.5
79	3.3		

Growth rate in 1989/90 is provisional figure.

Over the period of 1964 thru 1971, the Kenya's economy recorded an annual average growth rate of 6.5%. This growth was based on (1) the transfer of land from large to small farm use, (2) extension of the area under cultivation of high value crops, and (3) industrialization based on a strategy of import substitution. After the first oil crisis, the economic growth was slow down due to increases in prices of crude oil and the global recession, except the period of coffee boom (1977-1978).

In the early 1980's, the economy was generally stagnant caused by the second oil crisis in 1979, world-wide recession during 1981 to 1983 and severe drought in 1984. After 1985, the economic performance showed steady growth upto now.

The trend of the gross domestic products (GDP) during 1982 to 1990 is given in Table IV-2.1. The real GDP at constant price has been grown at the average annual rate of 5.1% since 1985 to 1990. GDP at current price attained K£ 7,330 million in 1989 and K£ 8,634 million in 1990, corresponding to the per capita GDP of K£ 343 (US\$ 317) in 1989 and K£ 360 (US\$ 313) in 1990.

## 2.2.3 Trade

In addition to coffee and tea which are the largest export commodities, horticulture and petroleum products has been increasing in recent years. Total share of these four commodities accounts almost 70% of the total exports. On the other hand, crude oil is the major import commodities. Since prices of those commodities in the international markets frequently fluctuate, low prices of coffee and tea as well as high price of crude oil cause large imbalance of trade, and a deficit of trade balance has been increasing as follows:

Items	(unit:K£ million)					
	1985	1986	1987	1988	1989	1990*
Total export	811	987	790	952	1,020	1,244
Total import	1,196	1,338	1,431	1,765	2,239	2,546
Balance of trade	-385	-351	-641	-813	-1,219	-1,302

Note : Growth rate in 1989/90 is provisional figure.

## 2.2.4 Balance of payments

The following is a summary of the balance of payments during 1985 to 1990 in Kenya:

Items	(unit:K£ million)					
	1985	1986	1987	1988	1989	1990*
Current account	-79.4	-31.1	-406.6	-408.1	-604.2	-544.2
Capital account	-4.6	102.1	307.2	344.6	681.4	373.6
Errors and omissions	-10.2	1.9	-5.0	4.3	3.3	1.6
Overall balance	-94.2	+73.0	-104.4	-67.7	80.5	-168.9

A favourable balance of payments position was attained in 1986 due to a combination of high coffee prices and a dramatic fall in world oil prices. In addition, agricultural output also benefited from favourable climatic condition. A deficit of K£ 76 million on the overall balance of payments was incurred in 1987 in comparison with a surplus of K£ 73 million in 1986. The down-turn in 1987 on the balance of payments resulted from a sharp fall in the world price of coffee and tea and rise in the price of crude oil.

In 1989, the balance of payments improved remarkably with overall surplus of K£ 81 million, owing to large inflow of official capital from the International Agencies and tourism earnings. In 1990, the balance of payments recorded a deficit of K£ 169 million. This was caused by the reduction of private and public capital and increase of oil price by Gulf Crisis.

### 2.3 Agriculture in Kenya

As mentioned in the above, the agricultural sector is the largest sector in Kenyan economy. The sector accounts about 30% of the gross domestic products, provides 50 to 60% of export earnings, as shown Tables IV-2.1 and IV-2.2. In addition, 83% of the population is located in the rural area, and their mainstay is agriculture to obtain food and income.

Land tenure in Kenya is divided into two categories, i.e. small holders (including landless tenant farmers) and large scale farms. Small scale holders are the majority of farmers, but produce mainly staple food crops for subsistence and very little surplus for marketing. Large scale farms conducts commercial farming in a big scale and produce cash and food crops for local and export market. Although the government has been promoting to transfer the large scale farms to small holders, the area under such commercial farms occupies large portion of the cropped land.

According to the Economic Survey, about 2.6 million tons of maize are produced on average, and the average annual production of staple food such as maize, beans, wheat and rice is about 3.5 million ton in total during 1985 to 1989. Coffee, tea, sugarcane, pyrethrum and horticulture are important cash crops. In particular, export amount of fresh vegetables and fruits as horticultural products has been significantly expanding, reaching more than 150 thousand tons or over 10% of the export earnings.

Since most of the agriculture production is made under the rainfed condition and depending on rainfall condition, self-sufficiency of staple food is not achieved in all years. Substantial imports of staple food are required in some years.

### 2.4 National Development Plan

#### 2.4.1 General

In 1984, the Government of Kenya launched the Fifth National Development Plan in order to follow the Fourth Development Plan which had terminated in 1983. Despite of the rapid strides of the development during the period of the previous Plan, Kenya has faced various complex economic problems, such as rural poverty, income disparities, negative balance of payments, deterioration of external financial position, etc. Following the Fifth Development Plan, the Sixth National Development Plan covering the period of 1989 thru 1993 was issued by the Ministry for Planning and National Development. The development plan mainly campaigns the following major objectives:

- 1) Economic expansion so as to create productive employment,
- 2) Economic growth depending mainly upon agriculture, re-vitalized industry, and small-scale enterprises sector,
- 3) Greater foreign exchange generation through expansion of the capacity of export oriented industrial sector,
- 4) Moderation in Government's provision of basic needs services,
- 5) More significant role of Government in caring for environment,
- 6) Greater role of private sector in economic activities,
- 7) Due regard to judicious management of public debt, stability of currency, and balance of payments,

- 8) Insurance of equitable distribution of the benefits of economic growth in order to improve welfare of people.

Kenya's economy has experienced various structural changes since the independence. In the light of the past population growth in Kenya, a consequential increase in the labour force is inevitable. There are two (2) million people who will enter the labour market during the Plan period, swelling the current estimated number of 8.6 million to 10.6 million. The challenge is how to provide adequate and productive employment for the labour force.

In due consideration of the current confronting issues and the economic trends in Kenya to be anticipated during the Sixth Development Plan period, the Government of Kenya sets forth the following development targets in the Plan in order to alleviate the problems and to adjust the economic and social structures:

(a) Sectorial Target

- Most important target is the growth rate in per capita income which is set at 1.6% per annum. With population expected to grow at 3.7% per annum; the implied annual growth rate of total GDP is 5.4% per annum.
- Agriculture continues to play a leading role in feeding the population, generating employment and incomes, contributing to foreign exchange earnings and inducing growth in other sectors of the economy. During the Plan period, this sector is targeted to grow at the rate of 4.5% per annum.
- The growth of the manufacturing sector has been weak in recent years. An Industrial Sector Adjustment programme mounted in 1988, together with a range of other measures aimed at raising the growth of investment. The 6.4% average target growth rate during 1988-1993 is expected to be met in the light of these consideration.
- Actual GDP growth rates in the trade sector have been higher in the years of 1984 thru 1987. A relatively high rate of growth during 1988 is anticipated, thus making the average annual rate of growth over the Fifth plan period higher than 7.0% per annum. During subsequent years, the growth rate is expected to stabilize at around 7.0% per annum.
- The target growth rates for the sectors of transport and communication, building and construction, and ownership of dwellings for the Plan period have been set at 5.7, 4.5, and 3.4% per annum, compared to the low growth rates of 3.4, 1.1, and 1.0% per annum respectively for the last Plan period.

(b) Projected Sectorial Shares

- The share of agriculture is targeted to go down from 31.6% in 1983 to 28.3% in 1993 or by the end of this Plan period. The shares of the other two sectors will go up correspondingly. The rise in the share of industry is a movement in the right direction in view of Government's commitment to making it a leading sector. The share of industry and services (including government services) is targeted to be 18.3% and 53.4% respectively in the Plan.

(c) Terms of Trade

- Kenya's agricultural and industrial sectors are heavily dependent on imported inputs such as fuel, fertilizers, machinery and spareparts which are purchased with foreign exchange mainly generated from exports of coffee and earnings from tourism.
- Kenya's terms of trade have generally been unsteady and often unfavourable. In 1986, Kenya's terms of trade index stood at 103.4 with 1982 as base. Due mainly to a substantial fall in the prices of coffee and tea and a rise in the price of fuel, the terms of trade deteriorated to 84.6 in 1987. Coffee and tea prices recovered to some extent during 1988 while the price of oil weakened again. As a consequence, the terms of trade are expected to improve somewhat in 1988 to a projected level of 94.6.

#### 2.4.2 Agriculture development

Agriculture is the mainstay of Kenya's economy and provides the basis for the development of other economic sector. Priority in the agricultural sector centres on food production, generation of raw materials for local industries and graduated processing of production for export. The overall thrust of the agricultural policy in Kenya is

- (1) to achieve internal self-sufficiency,
- (2) to maintain adequate levels of strategic reserves, and
- (3) to generate additional supplies for export.

The feeding of Kenya's growing population will require increasing supplies of staple foods. Production of these foods will be stepped up during the Plan period in order to meet the country's needs for internal self-sufficiency in the first instance. In particular, scientific and technological applications will be fully employed to ensure adequate supplies of all staples.

In addition to production of enough food to meet domestic demands, production levels will also be geared towards meeting strategic reserves sufficient to carry the country for at least six (6) months in the worst of times. This will entail the development of adequate storage facilities at appropriate location in all districts alongside national storage facilities.

The traditional cash crops-coffee and tea-will continue to make the major contribution to the export earnings. With diminished import substitution in the consumer goods industry, production orientation will change in favour of exportables. Under this policy framework, it will be imperative to boost production and productivity so that there are sufficient supplies of the relevant commodities available for export.

The Kenyan Government aims at diversification of agricultural production as a matter of policy. The promotion of seven major commodities are central to achieving the development goals and targets established for agriculture; these are coffee, tea, maize, wheat, milk, meat, and horticultural crops.

Development and expansion of coffee and tea will be the foundation for growth of both agricultural incomes and exports. Development and expansion of maize, wheat, and meat will aim at achieving domestic food security, while that of milk and horticultural products will aim at achieving both goals.

Production of maize, beans, and milk utilizes approximately two third of the land area devoted to agricultural production. There are, therefore, limited possibilities for further expansion of land development to the production of these commodities because this would lead to a reduction in output of the higher valued commodities, and consequently result in a sharp fall in the per capita value of agricultural production.

In addition to the sector's contribution to overall economic growth, it is also expected to make major contribution to employment generation. By the end of the Plan period, the total labour force will have reached 10.6 million compared with 7.5 million for 1984.

It is expected that the highest level of employment in agriculture will come from increased productivity in the small-holder agricultural area as a result of the impact of the incentive schemes to be implemented during the Plan period. A considerable number of jobs will also be created through expansion of the areas under coffee and tea development of small-scale irrigation schemes, and valley-bottom reclamation.

#### 2.4.3 Irrigation development

Irrigation development will make a major contribution towards the attainment of the objectives of the development plan. However, irrigation requires highly specialized agronomic and water management technologies. As of 1986, it was estimated that Kenya has irrigation potentials of about 500,000 ha and about 300,000 ha amenable to drainage and valley-bottom reclamation.

Currently, the area under irrigation covers only 36,000 ha of which 12,600 ha are under public management in Bunyala, Kano plain, Mwea and Bura, and some 23,000 ha under private management. Thus, the country has been able to utilize only 4% of her irrigation potentials.

In the past, the Government policy on irrigation has trended to favour large-scale irrigation schemes. However, the experience has shown that such schemes are expensive to implement and operate. On the other hand, small-holder irrigation schemes based on self-management group of farmers have proved relatively more

successful. Such schemes are basically oriented towards more employment generation, local foods security, and increased incomes. Owing to their low costs, the development of such small-scale irrigation schemes will be preferred during the Plan period.

The Kenyan Government will also work out a long term irrigation development strategy which will solve the conflict between small-scale and large-scale irrigation projects taking into account the availability of land, water, financial and manpower resources and the need for better institutional coordination between agencies involved in irrigation development.

Irrigation of strategic commodities such as coffee, rice, and horticultural crops will be given top priority since they show high irrigation yield potentials, which in turn, translate into high farm incomes and foreign exchange earnings. Thus, by the end of the Plan period, the total area under irrigation will have been expanded to 45,550 ha.

In effectively this expansion programme, priority will be given to the following measures:

- 1) Establishing operational irrigation units in the District having considerable irrigation potentials such as Kisumu, Taita Taveta, Elgeyo Marakwet and Meru,
- 2) Maintaining training programmes aimed at imparting to meet the needs of irrigation development
- 3) Creating a career structure for professional irrigation staff with a view to reducing the current development of trained manpower
- 4) Encouraging lending institutions such as the AFC (Agricultural Finance Corporation), cooperative and commercial banks and other financial institutions to seek investment opportunities in the irrigation sub-sector.

### 3. SITUATION OF THE LBDA REGION

#### 3.1 Land and Population

The LBDA region occupies about 39,000 km<sup>2</sup> in the western part of Kenya accounting for about 6.8% of the total land area of Kenya. The region lies between latitude 1°16'N and 1°54'S; longitude 33°55' and 35°51' E, and consists of Nyanza Province (Kisii, Kisumu, Siaya, South Nyanza), Rift Valley Province (Kericho, Nandi, Trans Nzoia and Uasin Gishu) and Western Province (Bungoma, Busia and Kakamega).

Over 70% of the total land area in the Region is classified as either high or medium potential based on average annual rainfall. About 55% of the potential land areas or about 1,549,000 ha has been developed for agriculture. A vast potential land still has not been fully utilized.

The population in the LBDA Region is estimated to be 8.9 million as of 1988, corresponding to about 40% of the total population of Kenya. The population in the Region is projected to be 10.2 million people in 1993 with a growth rate of 3.3%. The average population density is calculated to be 170 persons/km<sup>2</sup> for the Region.

#### 3.2 Economic Situation

The gross regional domestic product (GRDP) of the LBDA Region in 1985 is estimated at K£ 970 million with the growth rate of 3.8%. This GRDP shares 23.5% in the Kenya's GDP in 1985. It is estimated that the GRDP in 1989 is K£ 2,670 million sharing 36.4% of the Kenya's GDP.

The agriculture is the largest production sector, contributing about K£ 1,360 million or almost 50% out of the total GRDP of the region. Excepts public sector which shares 23%, manufacturing is second largest sector with share of 8%.

The region's share of agricultural production for major crops is significantly large compared with the GRDP and the area, i.e., approximately 70% of maize, 20% of sorghum, 30% of beans, 20% of rice, 80% of root crops, 98% of sugarcane, 60% of cotton, 66% of tea and 80% of wheat are produced in the region.

### 3.3 Five Year Development Plan in LBDA Region

The Lake Basin Development Authority was established in 1979 on the basis of the Parliament Act. The 1st Five Year Development Plan was launched by LBDA in 1983 and covered the period until 1988. Following the 1st plan, the 2nd Five Years Development Plan was launched covering the period of 1989 thru 1993 keeping pace with the Sixth National Development Plan.

#### 3.3.1 Development problems and constraints

Despite the high development potentials, the Lake Basin Region faces various problems and constraints for the development. They are classified into three major categories, i.e. natural factors, institutional factors, and human factors. Of the natural factors affecting the development, the most critical ones are as mentioned below:

- 1) Uneven distribution of water resources in time and place,
- 2) Shortage of exploitable energy sources,
- 3) Environmental condition to promote communicable and vector-borne disease,
- 4) Lack of delivery of health services,
- 5) Insufficient opportunities for higher education and economic activities

#### 3.3.2 Regional development objectives

Based on the position of the Region in the national economy, the development potentials and constraints, and the concepts of national development, the development objectives for the LBDA Region are set forth as follows in the 2nd Five Year Plan:

- 1) To provide the necessary infrastructure for an atmosphere to agricultural and industrial development,
- 2) To contribute to food security by maximizing agricultural production,
- 3) To improve the Regional economic structure by promoting a manufacturing industry on agro basis,
- 4) To narrow income disparity between region level and national level.

#### 3.3.3 Basic development strategy

Among the problems and constraints aforementioned, the following are fundamental problems which should be directly dealt with during the Plan period:

- Uneven distribution of water resources,
- Shortage of energy sources, and
- Under utilization of land and problems affecting land tenure systems

The first problem above calls for "proper management of water resources", which can contribute to coping with the second problem through hydropower development. Water shed management is another aspect related to the energy problem through the enhancement of forest resources. Another way of alleviating these natural and inherent problems is to improve the provision of other infrastructures and public facilities in order to increase land, water and energy productivity. Therefore, the basic strategy for the regional development is set forth as follows;

- 1) To develop and control water resources for primary production activities and for improved sanitation practices and facilities, so that development potentials in different areas of the Region can be realized
- 2) To improve the provision of infrastructures for agricultural and related economic activities, such as agro and aqua based industries

- 3) To rationalize land use; firstly, by intensifying cultivation in existing agricultural lands and secondly, by expanding the agricultural area in accordance with land suitability as well as existing land tenure systems
- 4) To develop human resources to meet the increasing requirement of higher technologies and wider expertise.

#### 3.3.4 LBDA programmes and projects

On the basis of the above development strategy, LBDA focus on food production, agro-based industries, environment, health, and energy. A list of the projects which will be started or expanded and intensified during the Plan period in the LBDA Region is given in Table IV-3.1.

Out of the projects listed in the table, high priority is given to Sondu-Miriu Multipurpose project, which will generate hydropower energy, provide domestic water supply and irrigate 26,000 ha in the Kano and Nyakach Plains.

#### 4. SOCIO-ECONOMIC CONDITION OF THE AREA

The study area covers 72,980 ha in total, which consists of 70,730 ha (97%) in Kisumu District and 2,250 ha (3%) in South Nyanza District. This area accounts 34.9% of Kisumu District (total area: 2,093 km<sup>2</sup>) and 0.4% of South Nyanza District (5,714 km<sup>2</sup>). Out of 14,930 ha of the project area, 600 ha (4%) extends in South Nyanza and 14,330 ha (96%) in Kisumu. Therefore, the socio-economic condition of the study area is focused on the Kisumu District.

The gross regional domestic products (GRDP) of the Kisumu District in 1989 is estimated at K£ 187 million, which shares about 14% of the GRDP of the LBDA region. Major sectors contributing GRDP is public service (K£ 72 million or 40%), manufacturing (K£ 35 million or 19%), commerce (K£ 21 million or 11%) and agriculture (K£ 13 million or 7%). In contrast with higher share of over 50% from agriculture in the LBDA region, 7% of the GRDP is accrued from agriculture.

Per capita GRDP in Kisumu District is also estimated at K£ 277, which 80% of the national per capita GNP level of K£ 343. As mentioned above, major sectors generating GRDP such as public services, manufacturing and commerce are centralized in the urban areas, therefore, per capita GRDP in the rural area which includes the study area is considered much lower. On the basis of the urban population of 197,000 and rural of 477,000 in 1989, per capita GRDP in the study area is estimated at only K£ 27.3.

##### 4.1 Administrative Area

Administratively, a District is divided into Divisions, a Division is subdivided into Locations, and a Location is composed of Sub-locations, which is the lowest level of government administration units. Divisions, Locations and Sub-locations are administered by District Officers, Chiefs and Assistant Chiefs, respectively. There are also sixteen wards in the Kisumu Municipality.

The number and boundaries of these administrations have been changing every year. There were 4 Divisions and 1 Municipality in Kisumu and 8 Divisions in South Nyanza at the time of the Population Census 1979, however, there are 6 Divisions and 1 Municipality in Kisumu and 9 Divisions in South Nyanza at present.

In the study area, there are 12 Locations in 6 Divisions, of which 11 Locations in 4 Divisions in Kisumu and 1 Location in 1 Division in South Nyanza. In addition to this, 4 wards in Kisumu municipality are located in the study area. Areas of Divisions and Locations in the study area are shown in Table IV-4.1 and summarized as follows:



District	Division	No. of Locations	km <sup>2</sup>
Kisumu	Winam	3 Locations	193.3
	Muhoroni	2 Locations	*1
	Nyando*2	2 Locations	331.0
	Upper Nyakach*2	3 Locations	114.5
	Lower Nyakach*2	1 Location	41.8
	(Kisumu Municipality - 4 Wards)		26.7
Sub-total	5 Divisions	11 Locations	707.3
South Nyanza	Kendu Bay*2	1 Location	22.5
Grand total	6 Divisions	12 Locations	729.8
Project area	4 Divisions	7 Locations	149.3

Note: \*1: Those 2 locations of Muhoroni Division area were shifted from Nyando Division in 1990. 4 locations in Muhoroni and Nyando Divisions can not be measured separately to estimate population, as shown in the following section. Therefore, these are counted in Nyando Division in this table.

\*2: Divisions include the project area.

## 4.2 Population

### 4.2.1 Census data

Although the provisional results of Population Census 1989 is available for district level, data on Population Census 1979 is employed to estimate indicators for population since most of the statistics are based on the Population Census 1979.

In Population Census 1979, population in Nyanza Province had been underestimated at about 11%, and Central Bureau of Statistics corrected the figure. According to Population Census 1979, population in Kisumu District and Kendu Bay Division in South Nyanza District is shown in Table IV-4.1, and summarized as follows:

Division	Population	Area (km <sup>2</sup> )	Population Density (persons/km <sup>2</sup> )
Kisumu District	482,300	2,101	230
Maseno	91,200	381	245
Nyando	155,700	862	181
Winam	32,300	145	223
Muhoroni	48,500	442	110
Municipality	152,600	271	564
South Nyanza District	847,600	5,927	143
Kendu Bay	106,000	431	246
Wang Chieng	20,000	92	216
Kenya total	15,327,000	564,162	27

Source: Population Census 1979, CBS. Detailed data are referred to Table IV-4.1.

Population Census 1979 shows that population in Kisumu and South Nyanza Districts was generally characterized by (1) high population density compared with the national average and (2) wide variation of density.

According to the provisional results of Population Census 1989, population in Kisumu District is 674,000 with the average annual growth rate of 3.35%. The population density is 321 person/km<sup>2</sup>, which is much higher than the national average of 37 person/km<sup>2</sup>.

### 4.2.2 Population in the study area

Population in the study area is estimated at 242,400 in 1990 and 325,100 in 2000 on the basis of Kisumu and South Nyanza District Development Plans and Population Projection prepared by CBS. The estimated figures are shown in Tables IV-4.3 and IV-4.4, and are summarized as follows:

Division/Location	Population in 1990	Population in 2000	
Kisumu District			
Municipality	28,400	36,300	
Winam	46,600	59,600	
Nyando and Muhoroni	75,100	96,200	
Upper Nyakach	30,700	39,200	
Lower Nyakach	11,800	15,100	
South Nyanza District			
Kendu Bay			
East Karachuonyo	6,500	8,500	
Total	199,100	254,900	
Population density (/km <sup>2</sup> )	273	349	
	Period		
	1979-1990	1991-1995	1995-2000
Average annual growth rate	3.34%	2.50%	2.50%

#### 4.2.3 Age structure

Population by age-group in 1990 and 2000 is estimated on the basis of population by age group in Kisumu District in Population Projection for Kenya 1980-2000 by CBS. The results are shown in Table IV-4.5, and summarized as follows:

	Age group	Male	Female	Total
1990	0-14	47,200 (47.5%)	47,400 (47.6%)	94,800 (47.6%)
	15-59	48,700 (49.0%)	48,800 (49.0%)	97,600 (49.0%)
	60+	3,500 (3.5%)	3,300 (3.3%)	9,800 (3.4%)
	Total	99,500	99,600	199,100
2000	0-14	59,600 (47.5%)	59,600 (47.6%)	119,200 (47.6%)
	15-59	61,300 (49.0%)	61,400 (49.1%)	122,600 (49.0%)
	60+	4,500 (3.5%)	4,200 (3.3%)	8,500 (3.4%)
	Total	125,200	125,200	250,400

Population of working age group (15 to 59 years old) in 1990 is estimated at 118,800 which accounts for 49% of the total population.

#### 4.3 Employment

According to the District Development Plan 1989-1993 of Kisumu and South Nyanza Districts, employment by sectors is as follows:

Sector	(unit : persons)					
	Kisumu		South Nyanza		Total	
Public sector	80,000	(29%)	7,000	(1%)	87,000	(10%)
Private sector						
Non-agricultures	45,600	(16%)	11,100	(2%)	56,700	(7%)
Agricultural*	155,400	(55%)	548,500	(97%)	703,900	(83%)
Total labour force	281,000	(100%)	566,600	(100%)	847,600	(100%)
Smallholder**	140,900	(50%)	488,500	(86%)	1629,400	(74%)

\*: Agriculture includes large farms, plantations and small-holdings.

\*\* : Small holders calculated by deducting public sector and non-agriculture sector from total force.

Above table shows that the employment is 100%, however, small holders in the agricultural sector is calculated by deducting public sector and non-agricultural sector from total labour force. This means that unemployment is included in the small holders in the agricultural sector.

Since employment of public sector and non-agricultural sector are mostly located in Kisumu Municipality, it is considered that the main employment generated in the project is agriculture sector.

#### 4.4 Land Categories

The land in Kenya is broadly classified into three categories, i.e. government land, freehold land, and trust land. Area by land category in Kisumu and South Nyanza Districts is shown in Table IV-4.5 and is summarized as below:

Land category	Kisumu		South Nyanza	
	(km <sup>2</sup> )	(%)	(km <sup>2</sup> )	(%)
Government land	726	27	2,065	27
Freehold land	303	11	0	0
Trust land	1,631	62	5,742	73
Total	2,660	100	7,778	100
Open water	567	21	2,064	27
Land area	2,093	79	5,714	73

Out of total area of 2,660 km<sup>2</sup> in Kisumu, open water covers 21% and land area is 2,093 km<sup>2</sup>. Total area of South Nyanza is 7,778 km<sup>2</sup>, consisting 2,064 km<sup>2</sup> (27%) of open water and 5,714 km<sup>2</sup> (73%) of land.

Trust land includes the lands for small holder registration. After the registration through land adjudication, trust land falls into private land.

Land Category	Kisumu		South Nyanza	
	(km <sup>2</sup> )	(%)	(km <sup>2</sup> )	(%)
Registered	538	39%	2,680	49%
Unregistered	827	61%	2,779	51%
Total	1,365	100%	5,459	100%

According to the Land Adjudication Office in Kisumu, the land in the study area is mostly trust land for small holder registration. These land is under adjudication or private land after registration. The status of registration and adjudication in the study area is shown in Table IV-4.7.

#### 4.5 Road and Transportation

There is a road network of 1,590 km in Kisumu District and 1,930 km in South Nyanza District as follows:

Type of road	Kisumu		South Nyanza	
	length (km)	density (km/km <sup>2</sup> )	length (km)	density (km/km <sup>2</sup> )
Bitumen	266	0.13	149	0.03
Gravel	478	0.23	0	0.00
Earth	842	0.40	1,781	0.31
Total	1,586	0.75	1,930	0.34

The main railroad line from Mombasa through Nairobi terminates in Kisumu, and additional rail link to Butere via Yala. Those lines are operated daily to transport passenger and commodities.

There is an airport in Kisumu, and 13 flights a week are operated between Nairobi and Kisumu. Expansion of this airport is planned to facilitate tourism and marketing of horticultural products in western Kenya.

Through Lake Victoria, lakeside towns and neighbouring countries are linked by means of steamers, cargo ships to transport passengers and goods.

#### 4.6 Post and Telecommunications

There are one head post office and 24 branches in Kisumu District. Telephone exchange capacity in Kisumu is approximately 8,170 with 11 exchange centres and 66 public telephone booths. Out of 8,170 lines, about 3,800 or 47% are utilized. In the study area, Ahero (70 lines), Koru (70 lines) have the exchange centres.

Postal and telephone services cover the whole district in South Nyanza, and expansion of these services is planned in the five year development plan.

#### 4.7 School

Number of education facilities such as nursery, primary school, secondary school, college, are listed in Table SE8-1. The enrollment ratio in 1987 is estimated about 111% in Kisumu 104% in South Nyanza. The figures over 100% means that students older than the obligatory go to school.

	Type	No.	Enrollment	Teachers
Kisumu	Nursery	398	32,100	460
	Primary	563	170,400	5,160
	Secondary	113	17,200	860
	Teacher training college	1	787	70
	Youth polytechnics	14	-	-
	Adult Education	26	6,700	260
South Nyanza	Nursery	470	41,000	450
	Primary	1,225	299,500	9,650
	Secondary	116	18,260	920
	Teacher training college	3	1,900	-
	Youth polytechnics	14	520	-
	Adult Education	966	25,600	990

Source: Socio-Economic Profiles, Ministry of Planning and National Development, June 1990.

According to the Literacy Survey of 1980/81 and 1988, the literacy levels have been improved, as shown in the following table:

District	1980/81		1988	
	male	female	male	female
Kisumu	57.1%	33.8%	51.7%	48.3%
South Nyanza	51.3%	25.5%	58.9%	41.1%

Source: Socio-Economic Profiles, Ministry of Planning and National Development, June 1990.

#### 4.8 Health Facilities

Number of health facilities such as hospitals, health centres, dispensaries are listed in Table SE9-1. There is one facility in every 11,500 persons in Kisumu and 16,100 persons in South Nyanza. According to the district development plan 1989-1993, another 10 facilities in Kisumu and 33 facilities in South Nyanza are proposed.

	Type	Total	GOK	NGO	
Kisumu	Hospital	5	2	3	
	Health centres	14	11	3	
	Dispensaries	40	28	12	
	Nursing Homes	5	1	4	
	Maternity Homes	1	-	1	
	Total	65	42	23	
	<u>facility/population</u>		<u>1:11,500</u>		
South Nyanza	Hospital	5	2	3	
	Health centres	43	38	5	
	Dispensaries	29	20	9	
	Total	77	60	17	
	<u>facility/population</u>		<u>1:16,100</u>		

Source: Socio-Economic Profiles, Ministry of Planning and National Development, June 1990.

Most common diseases are malaria, respiratory disease, skin disease, intestinal worms, diarrhoea, bilharzia, etc.

#### 4.9 Energy

Principal energy sources are fuelwood, charcoal, paraffin (kerosine), liquefied petroleum gas and electricity.

In Kisumu District, charcoal is the most popular in urban area and firewood in rural area. Annual charcoal consumption per household is estimated at 720 kg in urban area and 50 kg in rural area. Annual firewood consumption per household is estimated at 600 kg in rural area. In South Nyanza District, the most popular energy source is firewood, and is utilized by over 90% of households.

For lighting, paraffin is most common lighting method, as shown below:

(Unit:%)

	Electricity	Paraffin Pressure Lamp	Paraffin Safari Lamp	Paraffin Candle	Others
Kisumu	1.7	0.0	37.8	46.2	14.3
South Nyanza	0.0	0.8	19.8	70.7	8.7

Source: Socio-Economic Profiles, Ministry of Planning and National Development, June 1990.

Outlet of paraffin is commercial petrol stations. There are 11 stations in Kisumu District and 10 Stations in South Nyanza District.

#### 4.10 Water Supply

Domestic water supply is one of the important factor to raise living standard of people. Table IV-4.2 shows the percentage of population utilizing water supply by water source.

(Unit:%)

Source	Kisumu		South Nyanza	
	Dry Season	Rainy Season	Dry Season	Rainy Season
Piped water	29	26	5	4
Boreholes	8	14	11	14
Protected wells	14	14	-	-
Unprotected wells	6	8	-	-
Wells	-	-	10	12
River/streams	24	24	28	25
Springs	3	1	32	30
Lakes	16	9	13	8
Rain water	0	10	5	4
Others	0	0	1	5
Total	100	100	100	100

Source: Socio-Economic Profiles, Ministry of Planning and National Development, June 1990.

Out of various water sources, piped water, boreholes, protected wells supply relatively clean water. Beneficiaries of these water sources in Kisumu District over 50% of population, however, below 20% in South Nyanza District. Kisumu Municipality contributes high percentage of piped water supply. Therefore, it is considered that the condition of water supply in the study area is almost same as South Nyanza District.

##### 4.10.1 Nyakach water supply system

In the Nyakach plain located in the southern part of the study area, the Ministry of Water has constructed pipe line system for domestic water supply. The water for the system is taken from Sondu river and is treated in the plant located at Maraboi near Sondu village. Total length of main pipe line in the study area is about 40 km and number of total taps are about 180. The standard diameter of the main pipe is about 300 mm. The route of the main pipe line is shown in Fig.SE10-1.

The irrigation canals of the Kano Irrigation Project will cross the pipe line system. So, careful attention shall be paid in the project planning to avoid disturbance to the system or to minimize the cost of reconstruction.

#### 4.10.2 Rural domestic water supply and sanitation programme

The LBDA has commenced the Rural Domestic Water Supply and Sanitation Programme (RWSSP) in South Nyanza, Siaya, Kisii, and Kisumu districts in 1985. This project involves the construction of bore-holes, hand dug wells, dams, small pipe water schemes, springs protection and roof catchments. Other components of the programme include community development, health education and manufacturing of hand-pumps and spares for use in the region. Since 1985 the Authority has completed a total of 600 water points throughout Nyanza Province. The main objective of the project is to provide safe water, easily accessible and in adequate quantities at costs in keeping with the economic level of the rural community through facilities which can be operated and maintained by the rural beneficiary. The following is the distribution and phasing of water points in Kisumu district.

Year	1989	1990	1991	1992	Total
Water point	36	36	36	36	180

## ***Tables***





Table IV-2.1 Trend of Gross Domestic Products of Kenya

Item	(Unit:Kf'000,000)									
	1982	1983	1984	1985	1986	1987	1988	1989	1990	*
<b>Gross Domestic Products at Current Prices</b>										
A. Non-monetary Economy	165	199	216	246	264	297	342	396	427	
B. Monetary Economy	2,439	2,742	3,068	3,461	4,032	4,421	5,048	5,766	6,770	
1. Enterprises and Institutions	33	36	45	52	63	72	84	97	114	
2. Private Households	441	475	522	616	756	858	998	1,167	1,323	
3. Producers of Government Services	3,078	3,452	3,852	4,375	5,115	5,648	6,472	7,426	8,634	
Total	KE171	KE184	KE198	KE216	KE245	KE261	KE289	KE323	KE360	
Per Capita GDP in Kf	\\$268	\\$268	\\$251	\\$265	\\$306	\\$316	\\$311	\\$323	\\$313	
Per Capita GDP in US\$	964	1,127	1,244	1,357	1,598	1,669	1,903	2,088	2,235	
Agriculture	31.3%	32.6%	32.3%	31.0%	31.2%	29.6%	29.4%	28.1%	25.9%	
(% in total GDP)										
<b>Gross Domestic Products at 1982 Constant Prices</b>										
A. Non-monetary Economy	165	170	178	193	202	209	215	223	230	
B. Monetary Economy	2,439	2,460	2,459	2,573	2,724	2,857	3,002	3,146	3,286	
1. Enterprises and Institutions	33	35	37	40	44	49	55	62	71	
2. Private Households	441	460	473	497	529	554	586	618	647	
3. Producers of Government Services	3,078	3,125	3,148	3,303	3,498	3,668	3,859	4,050	4,233	
Total	964	979	941	976	1,023	1,063	1,109	1,153	1,192	
Agriculture	1.6%	1.6%	-3.9%	3.7%	4.9%	3.8%	4.4%	3.9%	3.4%	
GDP Growth Rate of Agriculture	31.3%	31.3%	29.9%	29.5%	29.3%	29.0%	28.7%	28.5%	28.2%	
(% in total GDP)										

Note: \*1: Provisional figures

Source: Statistical Abstract 1989 and Economic Survey 1991, Central Bureau of Statistics

Table IV-2.2 Export Trend of Main Agricultural Commodities

		(Unit: volume: 000 ton, value: K£000,000)											
		1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	Average *2 86-90
Total exports		488	514	546	633	755	785	956	753	918	1,000	1,233	972
Value													
Exports of Agricultural Commodities													
A. Coffee													
Volume		80.1	86.1	101.0	90.4	96.9	104.7	126.5	100.0	90.8	98.0	114.4	105.9
Value		108	109	145	160	204	231	388	195	245	203	221	250
% *1		22.1%	21.2%	26.6%	25.3%	27.0%	29.4%	40.6%	25.9%	26.7%	20.3%	17.9%	26.7%
B. Tea													
Volume		74.8	75.4	80.4	100.0	91.2	126.3	116.5	134.6	138.2	163.3	166.4	143.8
Value		58	61	76	123	189	192	173	163	185	272	315	222
% *1		11.9%	11.9%	13.9%	19.4%	25.0%	24.5%	18.1%	21.6%	20.2%	27.2%	25.5%	22.8%
C. Fruits & Vegetables													
Volume		-	-	-	-	-	-	119.2	146.6	161.8	134.2	188.8	150.1
Value		25	32	38	55	54	53	66	77	95	112	160	102
% *1		5.1%	6.2%	7.0%	8.7%	7.2%	6.8%	6.9%	10.2%	10.3%	11.2%	13.0%	10.5%
D. Maize (unmilled)													
Volume		1.0	0.9	0.9	122.5	47.4	17.7	228.0	247.7	167.2	110.2	159.9	182.6
Value		-	-	-	12	6	1	15	19	22	16	21	18
% *1		-	-	-	1.9%	0.8%	0.1%	1.6%	2.5%	2.4%	1.6%	1.7%	1.9%
E. Pyrethrum Extract													
Volume		0.3	0.1	0.2	0.2	0.3	0.2	0.9	0.5	0.5	0.5	0.5	0.6
Value		9	6	10	9	10	10	11	10	12	17	21	14
% *1		1.9%	1.2%	1.8%	1.4%	1.3%	1.2%	1.2%	1.3%	1.3%	1.7%	1.7%	1.4%
Sub-total of A, B, C, D and E													
Volume		200	208	269	359	463	487	653	464	559	619	738	606
% *1		41.0%	40.5%	49.2%	56.7%	61.3%	62.0%	68.4%	61.6%	60.8%	61.9%	59.8%	62.4%

Note: \*1: % of value in the total export.

\*2: Provisional figures

Source: Statistical Abstract 1989 and Economic Survey 1991, Central Bureau of Statistics.

Table IV-3.1 List of Programmes and Projects under LBDA Five Years Development Plan (1989-1993)

- 
- A) Energy Resources Development
- 1) Sondu Miriu Multipurpose Project
  - 2) Kuja River Multipurpose Project
  - 3) Nandi Forest Dam Multipurpose project
  - 4) Moi's Bridge Multipurpose Project
  - 5) Webuye Hydropower Project
  - 6) Teremi Falls Mini-hydropower Project
- B) Agricultural, Livestock, and Fisheries Development
- 1) West Kenya Rainfed Rice Project
  - 2) Yala Farm Complex
  - 3) Lambwe Valley Agricultural Complex
  - 4) Livestock Development Project
  - 5) Poultry Development Project
  - 6) Horticultural Development Project
  - 7) Bee Keeping Project
  - 8) Yala Swamp Reclamation and Development Project
  - 9) Nyando River Irrigation Project
  - 10) Lake Shore Irrigation Project
  - 11) Flood Control and Drainage Project
  - 12) Development of Small Scale Fish Farming in Lake Basin
  - 13) Integrated Fish Project
  - 14) Commercial Fish Farming
- C) Industrial Development
- 1) Building Materials Development Project
  - 2) Edible Oil Project
  - 3) Pig Complex Project
  - 4) Animal Feed Project
  - 5) Instant Coffee Project
  - 6) Tennery Project
  - 7) Soap Stone Industry Development Project
  - 8) Papyrus Mat Project
  - 9) Fruit Juice and Dairy Processing Project
- D) Health and Environmental Protection Programme
- 1) Rural Domestic Water Supply and Sanitation Programme
  - 2) Catchment Conservation and Rehabilitation Programme
  - 3) Family Planning, Information, Education, and Communication Demonstration Programme
  - 4) Effluent Monitoring and Pollution Control
  - 5) Rehabilitation of Kaimosi Dam
- F) Studies and Other Projects
- 1) Regional Development Studies
  - 2) Establishment of District Information and Documentation Centre
  - 3) LBDA Water Resources Data Base
- 

Source : Prepared by JICA Study Team

Table IV-4.1 Extent of Study Area and Project Area in Administrative Units

Division/Location*	Whole administrative area	Study area		Outside Study area		
	(sq.km)	(sq.km)	(%)	(sq.km)	(%)	
<b><u>Kisumu District</u></b>						
<b>Municipality</b>						
Ward 11, 12, 13 and 16	72.5	26.7	37%	45.8	63%	0.0
<b>Winam</b>						
East Kolwa	48.0					
Norht West Kano	66.0					
South West Kano	79.3					
Total	193.3	193.3	100%	0.0	0%	0.0
<b>Muhoroni and Nyando</b>						
Lower Norht East Kano	92.8					
North East Kano	143.4					
South East Kano	42.6					*1
East Kano	221.4					*1
Total	500.2	331.0	66%	169.2	34%	
<b>Upper Nyakach</b>						
North Nyakach	111.1	70.2	63%	40.9	37%	*1
Central Nyakach	73.0	44.3	61%	28.7	39%	*1
Total	184.1	114.5	62%	69.6	38%	
<b>Lower Nyakach</b>						
West Nyakach	97.7	41.8	43%	55.9	57%	*1
Total in Kisumu District	1,047.8	707.3	68%	340.5	32%	143.3
<b><u>South Nyanza District</u></b>						
<b>Kendu Bay</b>						
East Karachuonyo	92.4	22.5	24%	69.9	76%	6.0
Grand total	1,140.2	729.8	64%	410.4	36%	149.3

Source : District Development Plan 1988-1993, Kisumu.

Rural Domestic Water Resources Assessment, Kisumu District, RDWSSP, DHV, 1987.

Note : Administrative boundary of Division, Location and Sub-Location are as October 1990.

\*1: Locations includes the project area.

Table IV-4.2 Population Census 1979 in the Kismu and South Nyanza Districts (1/5)

District	Division	Location	Sub-Location	Population		Total	Number of House-hold	Family size	Area sq.km	Population density
				Male	Female					
Kisumu District	MASENO	<u>KISUMU EAST/WEST</u>		15,897	17,724	33,621	6,623	5.1	118.3	284
		MARERA		3,083	3,425	6,508	1,326	4.9	23.5	277
		KADONGO		2,038	2,279	4,317	856	5.0	25.5	169
		KARATENG'		2,487	2,913	5,400	1,060	5.1	18.5	292
		KAPUONJA		2,485	2,625	5,110	1,020	5.0	19.1	268
		MASENO TOWN		757	882	1,639	379	4.3	4.0	405
		BAR		2,148	2,406	4,554	911	5.0	14.2	321
		NYAHERA		2,899	3,194	6,093	1,071	5.7	13.5	453
		<u>SEME EAST</u>		14,841	17,239	32,080	6,072	5.3	140.1	229
		KAJULU-KOKER		1,578	1,793	3,371	594	5.7	19.5	173
		KIT-MIKAYI		1,816	1,960	3,776	689	5.5	15.2	249
		KOMBEWA		2,376	2,682	5,058	962	5.3	19.8	255
		KATIENO		1,961	2,425	4,386	742	5.9	18.0	243
		KOWE		1,316	1,658	2,974	634	4.7	16.1	185
		KOLUNJE		2,028	2,290	4,318	864	5.0	17.2	251
		KAILA		1,178	1,352	2,530	529	4.8	10.9	233
		RATA		2,588	3,079	5,667	1,058	5.4	23.4	242
		<u>SEME WEST</u>		12,603	14,884	27,487	5,546	5.0	122.5	224
		NGERE		1,061	1,302	2,363	491	4.8	21.5	110
		ALUNGO		1,102	1,318	2,420	559	4.3	17.9	135
RERU		2,752	3,452	6,204	1,300	4.8	17.9	347		
KANYADWERA		1,694	1,949	3,643	667	5.5	15.6	233		
OTHANY		1,849	2,010	3,859	839	4.6	11.8	327		
KADIANG'A		1,799	2,035	3,834	714	5.4	13.9	276		
ANGOGA		1,338	1,611	2,949	554	5.3	14.0	210		
KADERO		1,008	1,207	2,215	422	5.2	9.8	226		
Division total		43,341	49,847	93,188	18,241	5.1	380.8	245		

Source: Population Census 1979, before correction, CBS.

Table IV-4.2 Population Census 1979 in the Kismu and South Nyanza Districts (2/5)

District	Division	Location	Sub-Location	Population		Total	Number of House-hold	Family size	Area sq.km	Popu- lation density
				Male	Female					
Kisumu District	NYANDO	NORTHEAST KANO	KAMAGAGA	20,042	21,651	41,693	8,421	5.0	203.1	205
			WANGAYA 1	3,108	3,345	6,453	1,316	4.9	16.9	381
			WANGAYA 2	3,719	4,201	7,920	1,794	4.4	51.4	154
			SIDHO EAST	1,983	2,277	4,260	761	5.6	19.3	221
			SIDHO WEST	3,020	2,946	5,966	1,336	4.5	25.4	235
			KABAR	2,472	2,751	5,223	1,436	3.6	55.0	95
			AHERO IRRIGATION	4,295	4,583	8,878	1,111	8.0	29.4	302
			SOUTH EAST KANO	1,445	1,548	2,993	667	4.5	5.7	526
			KAKOLA	17,645	19,208	36,853	6,646	5.5	297.1	124
			KOCHOGO	3,642	4,155	7,797	1,635	4.8	74.3	105
			WAWIDHI A	2,250	2,457	4,707	972	4.8	15.5	304
			WAWIDHI B	3,391	3,715	7,106	936	7.6	46.1	154
			BORDER	4,180	4,816	8,996	1,662	5.4	103.4	87
			AHERO TOWNSHIP	3,277	3,207	6,484	1,022	6.3	56.9	114
			NORTH NYAKACH	905	858	1,763	419	4.2	1.0	1,836
			KABODHO EAST	15,959	18,170	34,129	6,489	5.3	184.1	185
			KABODHO WEST	4,719	5,474	10,193	1,725	5.9	40.6	251
AGORO EAST	3,738	4,233	7,971	1,481	5.4	48.6	164			
JIMO MIDDLE	1,909	2,159	4,068	895	4.5	16.7	244			
JIMO EAST	1,563	1,830	3,393	666	5.1	29.8	114			
GEM RAE	1,159	1,387	2,546	528	4.8	13.7	186			
AGORO WEST	1,729	1,908	3,637	728	5.0	21.9	166			
SOUTH NYAKACH	1,142	1,179	2,321	466	5.0	12.9	180			
EAST KADIANGA	11,092	12,847	23,939	4,233	5.7	79.5	301			
KAJIMBO	4,797	5,612	10,409	1,830	5.7	32.9	316			
EAST KOGUTA	2,789	3,173	5,962	1,097	5.4	24.1	247			
	3,506	4,062	7,568	1,306	5.8	22.5	337			

Source: Population Census 1979, before correction, CBS.

Table IV-4.2 Population Census 1979 in the Kismu and South Nyanza Districts (3/5)

District	Division	Location	Sub-Location	Population		Total	Number of House-hold	Family size	Area sq.km	Population density
				Male	Female					
Kisumu District	NYANDO	WEST NYAKACH	LOWER KADIANGA	8,995	10,062	19,057	4,025	4.7	97.7	195
			KADIANGA WEST	2,279	2,433	4,712	954	4.9	19.6	241
			WEST KOGUTA	3,191	3,651	6,842	1,544	4.4	34.0	201
			Division total	3,525	3,978	7,503	1,527	4.9	44.1	170
	WINAM	WEST KANO	NYMWARE	73,733	81,938	155,671	29,814	5.2	861.6	181
			KOCHIENG	15,608	16,697	32,305	5,173	6.2	145.0	223
			KOMBURA	2,788	2,870	5,658	778	7.3	19.3	293
			LOWER BWANDA	2,555	2,687	5,242	867	6.0	16.2	324
			UPPER BWANDA	2,052	2,358	4,410	821	5.4	17.4	253
			KODHIAMBO	920	1,045	1,965	277	7.1	20.1	98
MUHORONI	MUHORONI	KAWINO	1,632	1,737	3,369	555	6.1	24.2	139	
		KATHO	2,031	2,037	4,068	669	6.1	20.8	196	
		Division total	2,090	2,094	4,184	637	6.6	13.9	300	
		MUHORONI T.C.	1,540	1,869	3,409	569	6.0	13.1	260	
	KORU	KORU	KORU T.C.	15,608	16,697	32,305	5,173	6.2	145.0	223
			FT TERNAN	6,043	4,250	10,293	2,818	3.7	76.8	134
			MIWANI WEST	2,758	2,083	4,841	1,221	4.0	72.3	67
			MIWANI EAST	3,285	2,167	5,452	1,597	3.4	4.6	1,195
			Division total	3,994	3,571	7,565	1,687	4.5	78.4	96
				2,195	1,826	4,021	905	4.4	36.6	110

Source: Population Census 1979, before correction, CBS.

Table IV-4.2 Population Census 1979 in the Kismu and South Nyanza Districts (4/5)

District	Division	Location	Sub-Location	Population		Total	Number of House-hold	Family size	Area sq.km	Population density			
				Male	Female								
Kisumu District	MUHORONI	CHEMELIL	CHEMELIL	11,533	9,629	21,162	4,817	4.4	183.4	115			
			GOD ABUORO	3,507	2,341	5,848	1,716	3.4	67.2	87			
			SONGHOR WEST	1,238	1,044	2,282	402	5.7	28.9	79			
			SONGHOR EAST	1,027	893	1,920	453	4.2	23.7	81			
			UPPER TAMU	1,367	1,257	2,624	417	6.3	18.9	139			
			LOWER TAMU	1,207	1,000	2,207	564	3.9	8.5	260			
			KIBIGORI	1,357	1,124	2,481	505	4.9	15.6	159			
			SONGHOR T.C.	1,598	1,771	3,369	660	5.1	19.4	174			
			Division total	232	199	431	100	4.3	1.3	336			
			KISUMU MUNICIPALITY	27,638	20,882	48,520	11,925	4.1	442.1	110			
			Kisumu District	MUHORONI	CHEMELIL	WARD 1 KANYAWEGI	3,535	3,970	7,505	1,547	4.9	31.8	236
						WARD 2 OJOLA	2,009	2,022	4,031	632	6.4	17.3	233
						WARD 3 KORANDO	3,246	3,459	6,705	1,280	5.2	15.2	442
						WARD 4 KOGONY	3,420	3,477	6,897	1,452	4.8	10.4	663
						WARD 5 DAGO	1,321	1,390	2,711	438	6.2	11.9	228
						WARD 6 SWAHILI MKENDWA	197	229	426	70	6.1	1.0	426
						WARD 7 KONYA	2,076	2,233	4,309	706	6.1	13.5	319
WARD 8 KADERO	1,652	1,754				3,406	633	5.4	7.4	462			
WARD 9 WATH-OREGO	2,630	2,764				5,394	900	6.0	11.9	452			
WARD 10 KANYAKWAR	3,741	3,406				7,147	1,882	3.8	10.1	711			
WARD 11 MANYATTA	11,961	11,047				23,008	5,874	3.9	19.6	1,173			
WARD 12 KASULE	2,104	2,213				4,317	790	5.5	15.5	278			
WARD 13 NYALUNYA	2,008	2,147				4,155	776	5.4	12.8	325			
WARD 14 CHIGA	2,691	2,891				5,582	1,061	5.3	21.1	264			
WARD 15 BUOYE	2,409	2,675				5,084	1,015	5.0	26.9	189			
WARD 16 NYALENDA	11,553	10,225				21,778	5,795	3.8	24.6	886			
WARD 17 NORTH	3,178	2,411				5,589	1,191	4.7	5.9	950			

Source: Population Census 1979, before correction, CBS.



Table IV-4.2 Population Census 1979 in the Kismu and South Nyanza Districts (5/5)

District	Division	Location	Sub-Location	Population		Total	Number of House-hold	Family size	Area sq.km.	Population density
				Male	Female					
Kisumu District	KISUMU MUNICIPALITY	WARD 18 MILIMANI		2,207	1,924	4,131	821	5.0	3.9	1,053
		WARD 19 SOUTH		4,952	3,512	8,464	1,441	5.9	1.4	6,223
		WARD 20 WEST		1,750	1,595	3,345	687	4.9	0.5	6,968
		WARD 21 CENTRAL		4,287	4,360	8,647	1,486	5.8	1.0	8,647
		WARD 22 EAST		4,020	4,376	8,396	1,653	5.1	2.7	3,086
		GOT NYABONDO		775	841	1,616	328	4.9	4.2	388
		Division total		77,722	74,921	152,643	32,458	4.7	270.5	564
Kisumu District total		238,042	244,285	482,327	97,611	4.9	2,100.1	230		
South Nyanza district	Kendu Bay	<u>East Karachuonyo</u>		9,711	10,242	19,953	3,291	6.1	92.4	216
			Kamser-Seka	2,156	2,261	4,417	845	5.2	15.5	285
			Karabondi	1,368	1,504	2,872	464	6.2	16.1	178
			Kobala	2,050	2,124	4,174	445	9.4	16.5	253
			Kobula	2,103	2,241	4,344	678	6.4	25.3	172
			Kajjei	1,134	1,204	2,338	484	4.8	13.9	168
			Koogweno/Rakwarp	900	908	1,808	375	4.8	5.1	353
			Division total	51,754	54,154	105,908	15,395	6.9	430.5	246
			South Nyanza total	395,122	422,479	817,601	134,401	6.3	5,927.3	143
			Nyanza Province	1,271,672	1,372,284	2,643,956	463,321	5.7	12,530.6	211

Source: Population Census 1979, before correction, CBS.

Table IV-4.3 Population Projection in Kisumu and South Nyanza Districts

District/Division/Location*	1979	1979**	1989	1990	1995	2000	2005	2010
<b>Kisumu District</b>								
Maseno	93,200	103,600	130,200	134,500	152,200	172,200	194,800	220,400
Muhoroni	48,500	54,200	67,800	70,100	79,300	89,700	101,500	114,800
Municipality	152,600	169,600	213,300	220,400	249,400	282,200	319,300	361,300
Ward 11, 12, 13 and 16	53,300	59,200	74,500	77,000	87,100	98,500	111,400	126,000
Ward 14 and 15	10,700	11,900	15,000	15,500	17,500	19,800	22,400	25,300
Winam	32,300	36,000	45,100	46,600	52,700	59,600	67,400	76,300
Nyando	155,700	173,400	217,600	224,900	254,400	287,800	325,600	368,400
North East Kano and South East Kano	78,600		109,800	113,500	128,400	145,300	164,400	186,000
North Nyakach	34,100		47,700	49,300	55,800	63,100	71,400	80,800
South Nyakach	23,900		33,400	34,500	39,000	44,100	49,900	56,500
West Nyakach	19,100		26,700	27,600	31,200	35,300	39,900	45,100
<b>Total</b>	482,300	536,800	674,000	696,500	788,000	891,500	1,008,700	1,141,300
Annual growth rate			3.34%	3.34%	2.50%	2.50%	2.50%	2.50%
<b>South Nyanza District</b>								
Kendu Bay	105,900	-		141,200	174,300	185,200	220,141	261,674
East Karachuonyo	20,000			26,700	32,800	34,900	41,430	49,255
Annual growth rate			2.92%	2.92%	2.50%	2.50%	2.50%	2.50%

Source: District Development Plan 1988-1993, Kisumu and South Nyanza/Population Census 1979. CBS  
 \*: Since administrative boundaries have been changed after 1979, this estimation is made based on  
 on Population Census 1979.

\*\* : Population in Nyanza Province was under-estimated in Population Census 1979, and CBS  
 corrected the population afterwards.

Table IV.4.4 Population in Study Area

Division/Location*	Whole administrative area		Study area (sq.km)	Study area (%)	Population in 1990		Population in 2000	
	(sq.km)	(sq.km)			whole area	study area	whole area	study area
<b>Kisumu District</b>								
Municipality	Ward 11, 12, 13 and 16	72.5	26.7	37%	77,000	28,400	98,500	36,300
Winam	East Kolwa	48.0	48.0	100%	11,600	11,600	14,800	14,800
	Norht West Kano	66.0	66.0	100%	15,900	15,900	20,300	20,300
	South West Kano	79.3	79.3	100%	19,100	19,100	24,500	24,500
	Total	193.3	193.3	100%	46,600	46,600	59,600	59,600
<b>Muhoroni and Nyando</b>	Lower Norht East Kano	92.8	87.3	94%				
	North East Kano	143.4	67.0	47%				
	South East Kano	42.6	40.9	96%				
	East Kano	221.4	135.8	61%				
	Total	500.2	331.0	66%	113,500	75,100	145,300	96,200
<b>Upper Nyakach</b>	North Nyakach	111.1	70.2	63%				
	Central Nyakach	73.0	44.3	61%				
	Total	184.1	114.5	62%	49,300	30,700	63,100	39,200
<b>Lower Nyakach</b>	West Nyakach	97.7	41.8	43%	27,600	11,800	35,300	15,100
<b>Total in Kisumu District</b>		1,047.8	707.3	68%	314,000	192,600	401,800	246,400
<b>South Nyanza District</b>								
Kendu Bay	East Karachuonnyu	92.4	22.5	24%	26,700	6,500	34,900	8,500
<b>Grand total</b>		1,140.2	729.8	64%	340,700	199,100	436,700	254,900

Source : District Development Plan 1988-1993, Kisumu and South Nyanza.

: Population Census 1979.

: Rural Domestic Water Resources Assessment, Kisumu and South Nyanza, RDWSSP, DHV, 1987.

: Measurements by the study team.

\*: Administrative boundary of Division, Location and Sub-Location are as October 1990.

Table IV-4.5 Population by Age Group in Kisumu District and Study Area

Age group	Kisumu District						Study Area					
	Projection in 1990			Proportional extent			Population in 1990			Population in 2000		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
00-04	78,682	78,234	156,916	20.4%	20.2%	20.3%	20,200	20,100	40,400	25,500	25,300	50,800
05-09	58,007	57,692	115,699	15.0%	14.9%	15.0%	14,900	14,900	29,800	18,800	18,700	37,500
10-14	47,127	48,337	95,464	12.2%	12.5%	12.3%	12,100	12,400	24,600	15,300	15,600	30,900
Total under 14	183,816	184,263	368,079	47.5%	47.6%	47.6%	47,200	47,400	94,800	59,600	59,600	119,200
15-19	40,803	42,812	83,615	10.6%	11.1%	10.8%	10,500	11,000	21,500	13,200	13,900	27,100
20-24	34,480	36,340	70,820	8.9%	9.4%	9.2%	8,900	9,400	18,200	11,200	11,800	22,900
25-29	28,507	26,251	54,758	7.4%	6.8%	7.1%	7,300	6,800	14,100	9,200	8,500	17,700
30-34	23,476	19,996	43,472	6.1%	5.2%	5.6%	6,000	5,100	11,200	7,600	6,500	14,100
35-39	17,693	16,814	34,507	4.6%	4.3%	4.5%	4,600	4,300	8,900	5,700	5,400	11,200
Sub-total	144,959	142,213	287,172				37,300	36,600	73,900	46,900	46,100	93,000
40-44	14,476	14,653	29,129	3.7%	3.8%	3.8%	3,700	3,800	7,500	4,700	4,700	9,400
45-49	12,480	13,884	26,364	3.2%	3.6%	3.4%	3,200	3,600	6,800	4,000	4,500	8,500
50-54	9,770	10,285	20,055	2.5%	2.7%	2.6%	2,500	2,600	5,200	3,200	3,300	6,500
55-59	7,611	8,585	16,196	2.0%	2.2%	2.1%	2,000	2,200	4,200	2,500	2,800	5,200
Sub-total	44,337	47,407	91,744	11.5%	12.3%	11.9%	11,400	12,200	23,700	14,400	15,300	29,600
Total in 15-59	189,296	189,620	378,916				48,700	48,800	97,600	61,300	61,400	122,600
60-64	6,097	5,970	12,067	1.6%	1.5%	1.6%	1,600	1,500	3,100	2,000	1,900	3,900
65-69	3,932	3,756	7,688	1.0%	1.0%	1.0%	1,000	1,000	2,000	1,300	1,200	2,500
70-74	2,357	2,098	4,455	0.6%	0.5%	0.6%	600	500	1,100	800	700	1,400
75+	1,126	1,086	2,212	0.3%	0.3%	0.3%	300	300	600	400	400	700
Total in over 60	13,512	12,910	26,422	3.5%	3.3%	3.4%	3,500	3,300	6,800	4,500	4,200	8,500
Grand total	386,624	386,793	773,417	100.0%	100.0%	100.0%	99,500	99,600	199,100	125,200	125,200	250,400

Source: Population Projection for Kenya 1980-2000, CBS, 1983

Table IV-4.6 Land Category in Kisumu and South Nyanza Districts

Category	Kisumu		South Nyanza	
	(sp.km)	(%)	(sp.km)	(%)
<b>Government land</b>				
Forest reserves	0	0%	0	0%
Other govt. reserves	23	1%	0	0%
Townships	179	7%	0	0%
Allienated land	113	4%	0	0%
Unallienated land	1	0%	0	0%
National parks	0	0%	0	0%
Open water	410	15%	2,065	27%
<u>Sub-total</u>	<u>726</u>	<u>27%</u>	<u>2,065</u>	<u>27%</u>
<b>Freehold land</b>				
Smallholder scheme	303	11%	0	0%
Others	0	0%	0	0%
<u>Sub-total</u>	<u>303</u>	<u>11%</u>	<u>0</u>	<u>0%</u>
<b>Trust land</b>				
Not available for small holder registration				
Forest	0	0%	0	0%
Government reserves	5	0%	0	0%
Townships	246	9%	6	0%
Allienated land	15	1%	121	2%
Game reserves	0	0%	119	2%
National parks	0	0%	0	0%
<u>Sub-total</u>	<u>266</u>	<u>10%</u>	<u>246</u>	<u>3%</u>
Available for small holder registration				
Registered	538	20%	2,680	34%
Unregistered	827	31%	2,779	36%
<u>Sub-total</u>	<u>1,365</u>	<u>51%</u>	<u>5,459</u>	<u>70%</u>
<b><u>Grand total</u></b>	<u>2,660</u>	<u>100%</u>	<u>7,770</u>	<u>100%</u>

Source: Statistical Abstract 1989 (Ministry of Land Settlement and Physical Planning).

Table IV-4.7 Status of Land Adjudication and Registration in Sub-Locations in the Project Area

Division	Location	Sub-Location	Status
Winam	East Kolwa	Chiga	Registered
		Buoye	Under adjudication
	North West Kano	Nyamware	Under Adjudication
		Koching	Registered
		Koching	Under Adjudication
		Komoura	Registered
	South West Kano	Katho	Soon Registered
		Kawino	Under Adjudication
		Upper Bwanda	Under Adjudication
Kadhambo		Under Adjudication	
Nyando	Lower North East Kano	Lower Bwanda	Under Adjudication
		West Sidho	Soon Registered
		Central Sidho	Registered
	North East Kano	North Kamagega	Soon Registered
		West Kabar	Under Adjudication
		Wangaya II	Soon Registered
		North Kamswa	Village**
	South East Kano	South Kamswa	Village**
		Wangaya I	Registered
		North Kakala	Under Adjudication
		North Kochogo	Registered
	East Kano	South Kakola	Under Adjudication
South Kochogo		Under Adjudication	
Wawidhi A		Under Adjudication	
Wawidhi C		Not yet	
Border I		Soon Registered	
Upper Nyakach	North Nyakach	Wawidhi B	Under Adjudication
		Katolo	Under Adjudication
		Gem Rae	Registered
		Middle Jimo	Registered
	Central Nyakach	West Agero*	Registered
		Awach*	Registered
		West Kabodho*	Registered
Lower Nyakach	West Nyakach	West Jimo*	Registered
		Lisana*	Registered
		East Kabodho*	Registered
		Lower Kadianga	Registered
West Nyakach	West Kaguta*	Registered	
	Upper Kadianga*	Registered	

Source: District Land Adjudication Office, Kisumu.

Note : Division, Locations and Sub-Locations are as of September 1990.

\* : Part of the Sub-Location is situated in the study area.

\*\* : According to the District Land Adjudication office in Kisumu, these Sub-locations are identified as villages.



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