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Report No. 607a-KE

# Appraisal of a Site and Service Project Kenya

April 14, 1975

Transportation and Urban Projects Department

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## CURRENCY EQUIVALENTS

| | | | |
|---|---|---|---|
| US$1 | = | Kenya Shilling | 7.143 |
| Kenya Pound | = | US Dollar | 2.80 |
| Kenya Shilling | = | US Dollar | 0.14 |

(The official unit of currency in Kenya is the Kenya Shilling (K Sh). However, in accordance with the practice of the Kenya Government, some large values in the report are expressed in Kenya Pounds (K£)).

| | | |
|---|---|---|
| K£ | = | Kenya Shilling 20 |
| K Sh 1 | = | 100 Cents (Kenya) |

## WEIGHTS AND MEASURES

| | | |
|---|---|---|
| 1 meter (m) | = | 3.28 feet (ft) |
| 1 square meter ($m^2$) | = | 10.76 square feet (sq ft) |
| 1 kilometer (km) | = | 0.62 miles (mi) |
| 1 hectare (ha) | = | 2.47 acres |
| 1 liter (l) | = | 0.246 US gallons (gal) |
| 1 milligram (mg) | = | 0.015 grain |

## ABBREVIATIONS AND ACRONYMS

| | | |
|---|---|---|
| GOK | -- | Government of Kenya |
| GPT | -- | Graduated Personal Tax |
| NCC | -- | Nairobi City Council |
| NHC | -- | National Housing Corporation |
| NCCK | -- | National Christian Council of Kenya |
| IMF | -- | International Monetary Fund |

## FINANCIAL YEAR

January 1 - December 31

KENYA

APPRAISAL OF A SITE AND SERVICE PROJECT

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The original version of this report was prepared by Messrs. W. P. McCulloch, N. Lethbridge, P. Patel (Transportation and Urban Projects) and N. Jorgensen, F. Temple and S. Whitehead (Consultants). Messrs. C. E. Madavo, P. Patel and Ms D. Haldane (Transportation and Urban Projects) finalized the report. Messrs. P. Callejas, J. Huang and N. Tin appraised the sewerage component and prepared the related Annex.

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KENYA

APPRAISAL OF A SITE AND SERVICE PROJECT

SUMMARY AND CONCLUSIONS

i. The proposed Nairobi Site and Service project is the first large scale attempt by the Government and the Nairobi City Council to implement a low-cost solution to the shelter and service needs of the urban poor. The project is intended to be the first in a series of site and services in Nairobi and other Kenyan towns. While it will not satisfy the total demand for serviced plots in Nairobi, the technical assistance under the project will help formulate shelter programs designed to deal realistically with the needs of the urban poor and enable Government and Local Authorities to plan and execute such projects in the future.

ii. Large-scale provision of low-cost shelter and infrastructure is essential if Kenya is to provide for its rapidly expanding urban population. Roughly 1.6 million people or 13% of the total Kenyan population are in urban areas, with about 70% living in Nairobi and Mombasa. By 1980 another 600,000 urban dwellers are forecast, despite stated policies to reduce rural-urban migration and decentralize away from Nairobi and Mombasa.

iii. The impact of rapid urban growth is particularly evident in Nairobi. The city has about 730,000 inhabitants and has been growing at nearly 7% per annum. Unemployment is estimated at about 13% of the labor force and is rising. Annual conventional housing production has averaged about 2,000 units compared to 9,000 new households per annum, resulting in over one-third of the population living in unauthorized areas where unemployment is as high as 20%.

iv. The proposed project will provide 6,000 self-help housing units or 25% of the target for the city during the current Plan (1974-1978) at about one-third of the unit costs of previous housing programs. The project will include studies of (a) municipal finance and functions in Kenya to be conducted by the Government with assistance from the International Monetary Fund; (b) organization and management of the Nairobi City Council housing operations with special emphasis on budgeting and accounting techniques; and (c) preparation of future site and service and squatter upgrading projects in Nairobi and other Kenyan towns, with particular attention given to ways and means of creating employment.

v. Specifically the project would consist of:

(a) Residential Lots: preparation and servicing of 6,000 lots of four different sizes (100, 120, 140 and 160 $m^2$) with individual water supply and sewer connections;

(b) Core Units: construction of 6,000 sanitary core units of which 3,870 would have wet core only (Option A), 1,800 units one room built (Option B), 330 two built rooms including 30 completed demonstration units (Option C).

(c) Materials Loan Fund: loan financing of materials sufficient for self-help construction of dwellings to a maximum of two rooms;

(d) Community Facilities: construction of related facilities including 6 primary schools, 2 health centers, 2 multi-purpose community centers incorporating day-care facilities, 1 sports complex, and about 400 market stalls;

(e) Trunk Infrastructure: construction of trunk sewers, stabilization ponds and access roads; and

(f) Technical Assistance:

(i) Project Department operations;
(ii) detailed engineering and construction supervision fees;
(iii) studies: a joint GOK/IMF Municipal Finance Study, a Housing Operations Study for Nairobi City Council, and project preparation for future site and service and upgrading schemes;
(iv) monitoring: by a team from the University of Nairobi;
(v) nutrition: a survey of nutrition needs, possibly followed by a pilot scheme.

vi. The project site at Dandora 10 km east of the city center is easily accessible to existing and proposed employment centers and conforms with the city's development plan as set forth by the Nairobi Urban Study Group.

vii. The layout minimizes public land and infrastructure per area served and maximizes occupants' responsibility in maintaining the project area. The lots, varying in size from 100 $m^2$ to 160 $m^2$ are small, resulting in relatively high densities. Capital costs of site preparation, on-site services including individual water and sewerage and core units range from Kℏ310 (US$870) to Kℏ825 (US$2,310) per lot; roughly two-thirds of the project lots cost between US$870 and US$1,000, about 30% between US$1,400 and US$1,500, and 5% about US$2,310. The latter are included in the project both to introduce better social balance and, more particularly, to provide the basis for cross-subsidization.

viii. Total project costs, based on detailed engineering for the first 700 lots and preliminary engineering on the remainder, are estimated at Kℏ 10.54 (US$29.52) million. Physical contingencies range from 5% for

buildings to 15% for infrastructure. Price escalation has been calculated at 15% for 1975 and 12% annually for the period 1976 to 1979. Foreign exchange cost is estimated at about 26%.

ix. The financing plan consists of a K£ 5.72 (US$16.0) million contribution by IDA/Bank and K£ 4.82 (US$13.52) million by the Government. The bulk of IDA/Bank funds will be on-lent to the Nairobi City Council on Bank terms and those from the Government's resources at 6.5% and 25 years, the prevailing National Housing Corporation terms to Municipalities for housing projects.

x. The project would be executed over 5 years: lot preparation and servicing will take 3-1/2 years with disbursement on building materials loans for self-help housing extending over an additional 18 months. The trunk sewer component of the project will be carried out by the Nairobi City Council's Water and Sewerage Department. A special Project Department will be created to execute the remainder of the project.

xi. Civil works contracts and some supply contracts totalling K£ 4.45 (US$12.44) million will be let on the basis of international competitive bidding in accordance with Bank guidelines. Lesser works comprising mainly community facilities and the first phase area (1,000 plots) worth K£ 0.90 (US$2.52) million will be let on the basis of competitive bidding advertised locally in accordance with Nairobi City Council procedures acceptable to the Bank. Building materials loans amounting to K£ 1.1 (US$3.2) million will be made in cash with lot allottees making the purchase on their own.

xii. Particular care is being taken to ensure impartiality in the allocation of lots. Eligibility criteria will include: (a) household monthly income of between K Sh 280 (US$40) to K Sh 650 (US$90); (b) two years residence in Nairobi; (c) family living in Nairobi; and (d) non-ownership of other residential property in the city. Allottees and a waiting list for any subsequent transfers will be published. The cheapest lots (65% of the total) will be allocated to families with incomes between K Sh 280 and K Sh 500 per month. The next category (30% of the total) will be allocated to families earning K Sh 450 to 650 per month. The overlap in the two categories (i.e., between K Sh 450 and 500) allows for improvement in income. The third category (330 lots, or 5% of the total) will be sold at market prices to any buyer and the derived surplus used to cross-subsidize about 50% of the lots, all in Option A.

xiii. Allottees will be given 50-year renewable leases. Plot and materials loan repayment terms will be 8.5% interest rate and 30 or 20-year repayment periods for Option A and B lots respectively. Holders of Option A lots (wet core only) will be granted a grace period of 5 years on building materials loans to encourage faster consolidation; the grace period will not apply to occupants of Option B since they will have one-room core units.

xiv. Monthly charges will range from K Sh 73 (US$10) to K Sh 153 (US$20). Assuming expenditure for shelter and services of roughly 25% of monthly household income, Option A lots, constituting two-thirds of the project, will be

affordable by households as low as the 20th percentile in the city's income distribution curve. Option B lots would be affordable to households in the 30th and 40th percentile.

xv. The expected flow of funds generated by the residential component of the project shows a cumulative surplus ranging from about K£ 25,000 to K£ 380,000 during the first ten years. The sale price of Option C units, estimated K£ 1,200 is critical to the realization of this surplus. However, even if the profit on these units was reduced to half that expected, the cumulative account would experience only a small deficit in 1982 which would be elimated by 1984.

xvi. Nairobi's overall financial position has been extremely strained since the Government's abolition of the Graduated Personal Tax for municipalities in 1973; the Council's reserves are likely to be exhausted by 1977. The non-revenue producing project components will increase the projected deficit on NCC's General Fund by about K£ 50,000 in 1976 rising to roughly K£ 380,000 by 1980. Specific measures were discussed and agreed with the Government and NCC at negotiations to ensure NCC financial viability in the short term. The Government has requested assistance of the IMF to analyze municipal finance in order to formulate and implement longer-term solutions.

xvii. The rate of return on the housing component of the project, measured in terms of the stream of imputed rents from the expected housing units compared to costs, is about 19%. That of the sewerage component is estimated at about 15.5%.

xviii. The project is suitable for an IDA Credit of US$8.0 million and a Bank Loan of US$8.0 million equivalent for a term of 25 years including a grace period of 4 years.

# KENYA

# APPRAISAL OF A SITE AND SERVICE PROJECT

## I. INTRODUCTION

1.01 Bank interest in Kenya and Nairobi's urban problems dates back to reconnaissance missions in 1969 and 1971. In the earlier missions Bank staff sought to encourage the Government to incorporate in its National Development Plan ways of tackling the problems of urban growth with special reference to the needs of lower income groups. In March 1972, the Nairobi City Council began preparation of a site and service project which, at the request of Government, was limited to the capital where squatting is most serious. Although the Government and the Nairobi City Council were intent on implementing low-cost solutions to their urban problems, the legacy of high standard conventional housing approaches to shelter made the actual acceptance of lower and more realistic standards slow. The Government and the city now want to implement site and services and to examine other low-cost approaches to urban shelter including upgrading of existing squatter settlements.

1.02 This report is based on the findings of an appraisal mission which visited Nairobi in June/July 1974, comprising Messrs. W. P. McCulloch (Chief of Mission), P. Patel, N. Lethbridge (Transportation and Urban Projects Department) and Consultants N. Jorgensen, F. Temple, and S. Whitehead. The mission was assisted by R. Byron (Nairobi Office) and R. Reekie (East Africa Projects). A brief follow-up visit by Messrs. C. E. Madavo (Transportation and Urban Projects Department), J. W. Adams (East Africa Programs), J. Huang (Economic Development Institute), P. Callejas and N. Tin (East Africa Projects) took place in October 1974.

## II. BACKGROUND

### A. Urbanization and Government Policy

2.01 The current Development Plan (1974-1978) estimates Kenya's urban population (residents of towns of 2,000 and over) to be about 1.6 million or 13% of the total. Urbanization is occuring at a rate of approximately 6%, double the national population growth rate. Nairobi and Mombasa account for about 70% of the urban population with the remainder scattered in some 46 centers. Nakuru, in the former white highlands, with a 1974 population of approximately 66,000, Eldoret (25,000) and Kisumu (46,000) in Western Kenya, and Thika (25,000) near Nairobi, are among the more important secondary cities.

2.02 In an effort to encourage decentralization away from Nairobi and Mombasa, the Physical Planning Department in the Ministry of Lands and Settlement has classified Kenyan urban areas according to their current conditions, natural growth trends, and potential functions in relation to their hinterland. The framework will be used to encourage growth of a number of selected towns through such means as favorable treatment of investment made in them. This policy is expected to have only a marginal effect on growth prospects for Nairobi and Mombasa. Current projections show that Kenya's urban population will be about 2.2 million or 15% of the total by 1980 and between 26% and 32% by the end of this century -- a probably seven-fold increase over the next 25 years. The majority of this growth will occur in two or three principal cities.

2.03 Government is faced with the task of meeting the requirements of this rapidly expanding urban population. The major needs include:

- low-cost shelter and infrastructure consistent with limited available resources, including reductions of deficits in services and infrastructure for those already living in the urban areas;

- employment and income-producing activities;

- adequate municipal resources to deal effectively but economically with urban problems.

2.04 Although the Government's official planning has repeatedly emphasized the adoption of urban infrastructure and shelter standards affordable by the country as a whole, little real progress has been made. Past preoccupation with "acceptable standards" costing too much for the people or the economy to afford on any scale, has resulted in about one-third of the urban population living in unauthorized and unserviced areas. Although the Development Plan has called for suspension of squatter demolition, policy towards these areas remains ambiguous. During the preparation of the proposed Nairobi Site and Service Project frank discussions were held with Government on the need to find realistic solutions to problems of unauthorized settlements and to actually implement a lower standard urban shelter program on a meaningful scale.

2.05 Job creation in the formal sector has been slow, and standards regarding wage levels and employment conditions have further restricted expansion with the result that a substantial portion of Kenya's labor force is employed within the "informal" sector. A recent ILO mission on employment has recommended a strategy which would encourage informal sector employment through deregulation and active promotion of small-scale industrial activity, adoption of intermediate technology, vocational training and job promotion.

2.06 Finally, the financial base of Kenyan municipalities (see Annex 10) and their organizational structures are inadequate to deal with the developmental problems accompanying the rapid rate of urban growth. At

the end of 1973, a major source of municipal revenue -- the Graduated Personal Tax -- was abolished and as yet no replacement has been found, leaving most municipalities in dire financial straits. As a result, the Government setup a Working Party on Municipal Finances to address this problem, and as follow-up to its submitted report, the Government is to undertake a detailed study of municipal finance in Kenya with assistance from the IMF. 1/ Meanwhile, Government has agreed to provide NCC or enable NCC to provide itself with funds adequate to meet its reasonable recurrent and development expenditure until such time as NCC through the implementation of the results of the above study or otherwise, no longer requires such assistance.

## B. Nairobi

2.07 Problems resulting from rapid urbanization are particularly acute in Nairobi, the capital and economic center of Kenya. In 1970, 39% of the jobs and 44% of the earnings in the country's modern sector (excluding agricultural enterprises) were in Nairobi. The city's population was estimated at 730,000 in 1974, the result of an annual growth rate of about 7% over the past decade. It is projected to be a little over a million by the end of this decade, reflecting a slightly higher rate of growth.

2.08 Growth has been accompanied by a changing population mix particularly since Independence; colonial whites and non-citizen Asians have been leaving the city and Africans have been coming from the hinterland in ever-increasing numbers. The Asian and white populations have decreased at estimated average annual rates of 2.8% and 3.1% respectively between 1962 and 1975, while African population has grown at about 8.6%. In spite of the large African influx, Nairobi still exhibits two distinct faces. Within the past decade the city has become an aspiring international center. The relatively rich whites of the colonial era are being replaced by employees of multi-national corporations and other foreign and international agencies. These expatriates, together with the Asian and Kenyan elites, comprise the modern and more visible Nairobi. The working poor and the new migrants living in unauthorized settlements comprise the other Nairobi. It is on the problems of the latter that this report and the proposed project focus.

2.09 Nairobi's unemployment problem encompasses not only those without jobs but the even larger number who do not earn enough to meet their basic needs estimated at K Sh 200 per household per month for a household of five. An NCC study estimated that a little over 13% of Nairobi's labor force was unemployed in 1971. An ILO study on employment in Kenya found that over 20% of adult males and 50% of adult females in Nairobi are either unemployed or

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1/ A formal request for such assistance was submitted to the IMF on March 7, 1975.

have inadequate income as defined above. This situation is steadily deteriorating due to the relatively slow annual expansion of formal sector employment. Even with rapid growth in informal sector activities, unemployment can be expected to increase.

2.10 Construction of new housing in Nairobi during the past decade has been totally inadequate (see Annex 2). The conventional private housing subsector has produced about 1,000 units annually in recent years. However, these units cater exclusively to the middle- and upper-income groups, typically cost more than K£ 5,000 (US$14,000) each. The conventional public housing subsector, through the Nairobi City Council and the National Housing Corporation, has been producing an annual average of approximately 1,000 houses during the past few years. Most of these units have averaged K£ 1,500 for NCC and K£ 2,300 for NHC, which puts them beyond the means of the poorest third of the population.

2.11 The disparity between an annual addition of some 9,000 households to the city and the production of only about 2,300 new units by the public and private formal subsectors explains why squatter and other unauthorized housing development has been so vigorous in recent years. A 1971 study concluded that one-third of the city's inhabitants were living in uncontrolled, illegal areas in overcrowded conditions. There are broadly two types of unauthorized development in the city: the first follows the typical squatter pattern of building illegally on land not owned by the builder; the second is that of unapproved housing (usually rental units) built by groups or individuals on land that they own.

2.12 The squatter population in Nairobi is a well established, permanent community whose housing condition is more a result of the lack of access to land and credit than of overt poverty. Over three-quarters of household heads have been in Nairobi for an average of 17 years and nearly half are wage-employed, earning over K Sh 200 per month. Another third are self-employed, earning roughly K Sh 100; 20% have no visible source of cash income. While the majority of residents are therefore productively employed and have fairly regular, though low, incomes, unemployment is relatively severe among the younger and less educated.

2.13 The discrepancy between stated and actual housing policy is particularly evident in Nairobi. Public sector conventional housing construction continues to be heavily biased towards middle- and high-cost units and the city policy towards squatter areas has sharply fluctuated. Until recently, civic authorities have persistently demolished squatter developments without providing rehousing. In one instance, however, when Mathare Valley, the city's largest concentration of uncontrolled housing (population 90,000) was threatened with a cholera epidemic, the City Council did make an effort to upgrade the area. As a condition of this project, NCC has agreed, in accordance with present Government policy, not to engage in substantial demolition of unauthorized dwellings in areas subject to its jurisdiction.

2.14 The lack of decisive policy and action programs in the field of shelter are further exacerbated by the absence of an effective implementation

machinery within the Nairobi City Council (NCC). Although the NCC's staff and expenditure levels have expanded considerably during the past decade, its housing delivery system has not been adapted to the challenges posed by the city's rapid growth. The Council's current departmental committee system is administratively cumbersome and is not conducive to the establishment of overall shelter priorities and policies for the city. The lack of coordination among the various departments and committees impairs the Council's ability to make decisions and to implement projects quickly and efficiently.

2.15 No less pressing are the problems of municipal finance. NCC finances had until recently been reasonable, covering a substantial part of expenditures through user charges, the Graduated Personal Tax (50% of revenue) and property tax (35%). The 1973 abolition of the Graduated Personal Tax dramatically affected NCC finances. The City Council has been incurring annual deficits on General Fund current account since 1972, and projections of the Council's financial position indicate that resources will be exhausted by 1977 (see Annex 10). Until longer term solutions are implemented (para 2.06) Government has undertaken to ensure NCC financial viability.

2.16 In response to the rapid growth of the city resulting in some of the problems summarized above, the Nairobi City Council embarked on a comprehensive urban development study in 1971. The study report issued in 1973 1/ outlined a development strategy consisting of both a series of policy approaches in the areas of land use, employment, housing, and transportation, and a broad physical structure plan within which these approaches might be realized. The structural plan directs most long-term growth in the city toward the east and the north with some spotting in the southwestern part. Study recommendations on policy approaches are summarized in Annex 1. Regarding housing, the salient recommendations were that NCC formulate a realistic program which, while encouraging provision of middle and upper income housing, emphasized shelter for lower income groups through serviced sites and improvement of squatter settlements.

2.17 Recently the City Council has embarked on a number of projects which are broadly in keeping with the thrust of the Urban Study recommendations. Three of these schemes, including the proposed site and service project, are being undertaken with assistance from external sources. The first phase of a 5,000 unit housing project being financed by the Commonwealth Development Corporation (CDC) has just been completed. The units, costing K£ 2,000 (US$5,600) and up will be affordable by upper income groups. To cater for middle income households, the City Council is negotiating a loan for a project comprising about 2,900 housing units with the USAID Housing Guaranty Program. The sale prices for the units will range from K£ 900 (US$2,520) to K£ 1,300 (US$3,640). The proposed project of 6,000 site and service units with lot costs (services and core units) ranging from K£ 310 (US$870) to K£ 825 (US$2,310) is targeted at much lower income groups forming an important complement to the CDC and USAID-supported projects. The

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1/ Nairobi Metropolitan Growth Strategy (1973); City Council of Nairobi.

three schemes together would provide about one-third of the housing units required to accommodate population increase in the city during the current Plan (1974-1978). Additional construction will be undertaken when the city's finances improve sufficiently to support a new capital program.

2.18 The proposed site and service project would, in addition, deal with some of the broader urban needs (para 2.03) and improve NCC capacity to implement future low-income shelter projects. The project would address the lack of an effective shelter policy by assisting Government to implement the first large-scale, low-cost solution to urban shelter and infrastructure-a major objective of the last two Development Plans which has never been realized. In addition, the project would include preparation of future site and service and squatter improvement projects in three Kenyan towns. The project would further attempt to identify solutions to the difficulties being experienced by Kenyan municipalities through studies of: (a) municipal finance throughout Kenya; and (b) a reorganization of NCC housing operations.

## III. THE PROJECT

### A. Project Description

3.01 The proposed project consists of:

(a) New Residential Lots: preparation and servicing of approximately 6,000 lots of four different sizes (100, 120, 140 and 160 $m^2$) with individual water supply and sewer connections;

(b) Core Units: construction of 6,000 sanitary core units of which 3,870 would have wet core only, 1,800 units one built room, 330 two built rooms of which 30 would be completed demonstration units;

(c) Materials Loan Fund: financing of materials loans for self-help construction of dwellings to a maximum of two rooms;

(d) Community Facilities: construction of related facilities including 6 primary schools, 2 health centers, 2 multi-purpose community centers incorporating day-care facilities, sports complex, and about 400 market stalls;

(e) Trunk Infrastructure: construction of trunk sewers, stabilization ponds, and access roads required for the project;

(f) Technical Assistance:

(i) Project Department operations;

(ii) detailed engineering and construction supervision fees;

(iii) studies: a joint GOK/IMF Municipal Finance Study, a Housing Operations Study for Nairobi City Council, and project preparation for future site and service and upgrading schemes;

(iv) monitoring: possibly by a team from the University of Nairobi;

(v) nutrition: a survey of nutrition needs possibly followed by a pilot scheme.

3.02 New Residential Lots: The project would provide about 6,000 lots with individual water and sewer connections and related basic services and infrastructure, including roads, security lighting, and refuse collection. The 6,000 lots include about 1,800 of 100 $m^2$, 2,100 of 120 $m^2$, 1,800 of 140 $m^2$, and 300 of 160 $m^2$ each.

3.03 Core Units: In order to accommodate different income levels and needs within the low-income sector, three alternative levels of contractor built shelter would be developed on the serviced lots. Approximately 65% of the lots will have built wet cores consisting of a w.c. and washroom (Option A); 30% of the lots will have built wet cores plus one room (Option B); and 5% will have wet cores plus two built rooms including about 30 fully built demonstration units (Option C).

3.04 Materials Loan Fund: Materials loans (for terms see para 5.06) would be made available to project participants for self-help extensions to supplement other sources of funds, including personal savings and borrowings. Allottees of Option A would be eligible for loans of about K£ 240 (US$670) representing the cost of two rooms; those of Option B would be eligible for K£ 120 (US$335) equivalent to the cost of one room. Participants will construct or extend their own dwelling on the basis of approved designs.

3.05 Community Facilities: The project would construct primary schools, health centers, multipurpose community centers incorporating day-care facilities, sports facilities, and markets. The criteria used in determining the provision of community facilities are discussed in Annex 7, and design standards and cost estimates are shown in Annex 5. Primary schools, accounting for about 60% of the investment in community facilities, would provide up to 5,600 student places -- allowing the project area the same level of provision as the rest of Nairobi. The community centers would accommodate activities such as community meetings, adult education, and other recreation.

3.06 Trunk Infrastructure: The trunk sewerage will comprise: two branch sewers from the project area to the proposed main city trunk sewer, 14.5 km of main trunk sewer running alongside the Nairobi river to the sewerage treatment works at site D (Map 11069), a temporary stabilization pond to serve the first 1,000 housing lots by mid-1976, and a sewage treatment works consisting of stabilization ponds with a capacity to treat an average waste water flow of 30,000 cubic meters per day (6.6 IMGD) -- adequate to serve the equivalent of 230,000 people. The sewerage works are in accord with the proposals on the First Stage Program for Sewerage and Drainage for Nairobi prepared by consultants (SWECO of Sweden) as part of the long-term sewerage needs of the city. NCC will appoint consultants to do the detailed engineering for sewerage works which is expected to start by mid-1975.

3.07 Technical Assistance: The project would finance costs of the Project Department and of detailed engineering and construction supervision. Also included are the financing of studies and project monitoring and evaluation.

3.08 Studies: The studies to be undertaken as part of the project include: (a) municipal finance and functions throughout Kenya to be conducted jointly by the Government and the International Monetary Fund; (b) NCC Housing Operations; and (c) preparation of future site and service and upgrading schemes in Nairobi and other urban areas. The joint GOK/IMF Finance Study will take into account the findings of the Government's Working Party on Municipal Finances whose report is under consideration, and provide technical details on how the Government should deal with the financial crisis facing the country's local governments. The Government has already requested IMF assistance and the terms of reference for the study have been agreed between the Government and the IMF. The NCC Study, to be carried out by consultants under terms of reference acceptable to the Bank, will result in proposals for the reorganization of Council's housing operations, including budgeting and managerial techniques. Terms of reference for the study are shown in Annex 11. Preparation of follow-up projects mentioned under (c) above will be done under the direction of the Ministry of Housing and Social Services in accordance with terms of reference acceptable to the Bank. Terms of reference are attached as Annex 12.

3.09 Monitoring: Monitoring and evaluation of the project will be done by a team from the University of Nairobi under the supervision of the Planning Section of the Ministry of Finance and Planning. The evaluation will also focus on the project's effect on the complex socio-economic patterns of low-income families. The Ministry of Finance and Planning has agreed to monitor and evaluate the project for a duration and in accordance with terms of reference acceptable to the Bank.

3.10 Nutrition: Over the project implementation period, UNICEF will assist the Nairobi City Council to carry out a survey of nutrition needs in sample low-income areas in the city, to review the current NCC nutrition program which consists primarily of supplementary feeding, and to formulate

a possible pilot nutrition project. UNICEF is prepared to fund a survey and to consider financial assistance to NCC for an appropriate pilot scheme resulting from such a survey. UNICEF has committed about US$15,000 for this purpose.

## B. Design Standards

3.11 The project site at Dandora was chosen from among nine sites on the basis of conformity with the city's development plan (Annex 1), suitability for low-income housing, and easy accessibility to present and planned employment centers. The journeys by bus to the city center or to the main industrial area, both about 10 km away, take 15-25 minutes and monthly transport costs would average about 7% of target household monthly income which is considered reasonable. 1/ Two other industrial areas, Dandora Industrial Estate and Ruaraka, are within walking distance (2 km ) of the project site. These areas are expected to expand rapidly over the next few years because of the off-site infrastructure provided under this project and the Nairobi Water Supply Project (Loan No. 714-KE). The off-site employment will be supplemented by jobs in the project area, first in the construction of the project and in the service sector. The 400 market stalls included in the project are expected to generate about 1,000 jobs. Service sector employment can be expected to increase as the project area population grows.

3.12 The site layout is designed to minimize public land and infrastructure investment per area served and to maximize individual responsibility. Lots are arranged in lateral blocks with rows of service wet cores back-to-back. This configuration is the most economical in terms of the infrastructure networks. The layout also provides for flexibility in the overall site planning to introduce variety and accommodate future change. The community facilities, including land reserves for commercial use and secondary schools, are concentrated on a central spine which reduces costs considerably. Descriptions of the physical planning and design standards employed in the project are contained in Annexes 4 and 5.

3.13 Lot sizes are small and have enabled the project to achieve relatively high densities. Gross densities average 32 lots or 160-300 persons per hectare assuming 5-10 persons per lot.

3.14 Standards of utility servicing and unit costs are presented in Annex 5. All lots will have individual water supply and water-borne sewerage provided in contractor-built sanitary core units. These standards are considered reasonable in view of the savings achieved through the smaller lot sizes. The capital costs per lot for the various options range from K£ 310 (US$870) to K£ 355 (US$995) for Option A lots which constitute two-thirds of

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1/ K Sh 1.2 - 1.4 round trip, assuming one employee per household.

the project, from Kƀ 490 (US$1,370) to Kƀ 530 (US$1,485) for Option B lots representing about one-third, and Kƀ 825 (US$2,310) for Option C -- roughly 5% of lots. For details see Annex 9.

3.15 Community facilities designs are based on a simple modular system (see Annex 4). By using the same structural system for all community facilities, costs are reduced by one-third in comparison with similar facilities built to the usual NCC standards.

## C. Cost Estimates

3.16 Cost estimates for site preparation, on-site servicing and core units are based on detailed engineering for about 700 lots and preliminary engineering for the remainder. Estimates for trunk infrastructure are based on preliminary engineering. Total project costs are estimated at Kƀ 10.54 (US$29.52) million at January 1975 base prices. Physical contingencies of 15% on lot preparation and infrastructure, and 5% on community facilities and core units are included. Price escalation has been calculated at 15% in 1975 and 12% annually for the period 1976 through 1979. Foreign exchange costs are estimated at about 26%. The main costs categories are summarized in the following table with detailed cost estimates presented in Annex 5.

Cost Estimates

| | KŁ'000 | | | US$'000 | | | % of Total Project Costs |
|---|---|---|---|---|---|---|---|
| | Local | Foreign | Total | Local | Foreign | Total | |
| 1. Site Preparation | 109 | 9 | 118 | 305 | 27 | 332 | 1.6 |
| 2. On-Site Infra-structure | 803 | 268 | 1,071 | 2,250 | 750 | 3,000 | 14.4 |
| 3. Community Facili-ties | 295 | 98 | 393 | 824 | 275 | 1,099 | 5.3 |
| 4. Core Units | 1,146 | 382 | 1,528 | 3,209 | 1,070 | 4,279 | 20.6 |
| 5. Materials Loan Fund | 1,145 | - | 1,145 | 3,205 | - | 3,205 | 15.4 |
| 6. Trunk Infra-structure | 1,461 | 702 | 2,163 | 4,092 | 1,965 | 6,057 | 29.2 |
| 7. Technical Assistance | 466 | 477 | 943 | 1,304 | 1,336 | 2,640 | 13.5 |
| 8. Subtotals | 5,425 | 1,936 | 7,361 | 15,189 | 5,423 | 20,612 | 100 |
| 9. Contingencies: | | | | | | | |
| Physical (7.9% of base cost) | 364 | 223 | 587 | 1,019 | 624 | 1,643 | |
| Price (32% of row 8 + 9) | 1,972 | 623 | 2,595 | 5,522 | 1,744 | 7,266 | |
| Total | 7,761 | 2,782 | 10,543 | 21,731 | 7,790 | 29,521 | |

## D. Financing

3.17 The sources of funds for the project are proposed as follows:

| | KŁ million | US$ million |
|---|---|---|
| IDA | 2.86 | 8.00 |
| IBRD | 2.86 | 8.00 |
| GOK/NCC | 4.82 | 13.52 |
| TOTAL | 10.54 | 29.52 |

## E. Procurement and Disbursement

### Procurement

3.18 Civil works components of the project totalling K£ 4.45 (US$12.44) million and consisting of preparation and servicing of lots, construction of core units, access roads, trunk sewers and stabilization ponds, would be procured through international competitive bidding in accordance with Bank guidelines. However, the relatively small size and staging of the contracts and the capability of local contractors, makes it unlikely that foreign firms would be interested in these contracts. Advertising would be made in local papers with notifications to embassies. An active local construction industry exists (Annex 3) and domestic contractors would be accorded a preferential margin of 7.5% over foreign contractors in the evaluation of bids.

3.19 Contracts totalling K£ 0.90 (US$2.52) million comprising the construction of the community facilities, the first phase area (1,000 lots) and small urgent sewer works, would be awarded on the basis of competitive bidding advertised locally in accordance with NCC procedures and satisfactory to the Bank. Because of the need to synchronize the construction of community facilities with population increase in the project area, the facilities will be grouped into contracts of two or three units. Such contracts are likely to attract only local bids. Building materials loans worth K£ 1.1 (US$3.2) million would be made in cash with lot allottees purchasing their own materials.

3.20 IDA/Bank would disburse against: (i) 55% of the total costs of site preparation and servicing, construction of core units, community facilities; (ii) 55% of materials loan fund; (iii) 55% of the total costs of trunk sewers and stabilization ponds; (iv) 100% of foreign expenditures or 50% of local expenditures on consultants' services; and (v) 50% of local expenditures for Project Department Operations. Funds from the IDA credit would be disbursed first. Disbursements would be fully documented with the exception of the expenditures for Project Department operations, for which disbursement would be made on the basis of a statement of expenditures certified by the Project Manager. The documentation of the latter certification is not submitted for review but retained by the Borrower and available for inspection by the Bank during the course of project supervision. The estimated disbursement schedule is shown in Annex 13. Any surplus arising from the completion of the project at lower than estimated cost (including contingencies) would be used, with prior approval of the Bank, to provide additional Option A lots.

3.21 Due to the urgency of Nairobi's shelter problem and the need to initiate the NCC's Housing Operations Study (para 3.08) as quickly as possible, retroactive financing of US$300,000 to cover expenditures incurred after December 1, 1974 is proposed for detailed engineering, Project Department operations, and the Housing Study.

### F. Execution Schedule

3.22 The project would be constructed in two phases of 1,000 and 5,000 lots over 3-1/2 years with expected completion in mid-1978. Extension of self-help housing with the aid of materials loans will take an additional 18 months. Consequently, the project's closing date will be June 30, 1980. The execution schedule is shown in Chart IBRD 9324.

## IV. ORGANIZATION AND MANAGEMENT

### A. Water and Sewerage Department

4.01 The sewerage component of the project will be implemented by the NCC's Water and Sewerage Department (WSD) which is responsible for provision and distribution of water supply, and the collection and treatment of sewage for the city. The WSD was established under a Bank loan (No. 714 KE) made to NCC on December 11, 1970 and has implemented that project. While WSD has experienced some management difficulties mainly from staff shortages, its operating performance and financial results have been satisfactory, and it has been able to meet the financial requirements specified in the covenants of the Nairobi Water Supply Project (Loan 714 KE). The department is fully capable of executing this component of the project assuming the detailed engineering is done by the consultants (para 3.06). During negotiations it was agreed that NCC will no later than September 30, 1975 submit to the Bank a plan for reorganization of its Water and Sewerage Department. NCC also agreed to impose suitable sewerage rates to meet operating costs and debt service and other charges on long term indebtedness incurred for its sewerage (Annex 6, para 35).

### B. The Project Department

4.02 NCC has created a special Project Department to implement the site and service component of the project. The Department was necessary because the Council's Housing and Social Services Department is not capable of implementing a project of this size and complexity under its current organization and staffing. The Housing Operations Study (para 3.08) will make recommendations for reorganizing the Council's shelter delivery system and as reforms are instituted, the responsibility for completed lots and Project Department staff required for the self-help lot development and management will be transferred back into the department.

4.03 Rather than reporting to a series of Council Committees, the Project Department will be responsible to a single Committee which will consist of members from City Council and co-opted members from the Ministries of Finance, Local Government, Housing and Social Services, the National

Housing Corporation, and the Provincial Commissioner for Nairobi. Its secretary will be the Town Clerk, who will serve as the principal administrative link between the Project Department and the Council as a whole. The Committee was established by NCC under the same resolution.

4.04 The Project Department would consist of about 13 professional staff in three divisions: Technical, Financial and Community Development (see Chart 9325). The Technical Division will be responsible for supervising detailed engineering and preparation of tender documents for site infrastructure, wet cores, community facilities, and for ensuring proper supervision of construction. Technical staff with specific building skills will be available on site to show allottees how to perform technical tasks. In order to illustrate the techniques of housing construction, the Division will also erect demonstration units on the site.

4.05 The Finance Division will be responsible for keeping all project accounts involving expenditures related to the project. The Division will develop an accounting and financial management system acceptable to the Bank. At negotiations, it was agreed that the Department will prepare and send to the Bank quarterly financial reports and annual project accounts audited by an independent auditor acceptable to the Bank. Provisionally audited Project accounts which should be separate even after the merger (para. 4.09) should be forwarded to the Bank within six months of the end of each fiscal year until the end of the project construction (Dec. 31, 1981). Unaudited general NCC accounts should also be forwarded to the Bank within six months of the end of each fiscal year and comprehensive NCC accounts audited by an independent auditor acceptable to the Bank should be furnished to the Bank within 9 months of the end of each fiscal year.

4.06 The Community Development Division will publicize the project, solicit and process applications, orient and train allottees prior to the occupation of lots, work with families during the construction phase, and assist residents to develop the institutions and programs which will enable them to create a genuine community. These tasks are essential to the project's objective of comprehensive community development.

4.07 The Project Manager, Deputy Project Manager and Division Heads are being appointed in consultation with the Bank. In order to secure senior staff with the competence and experience necessary to implement the scheme, salary scales will be comparable to those for Government civil servants. Arrangements will be made for the secondment of experienced staff to the Department where appropriate. Appointment of staff members below the level of Division Heads will be the responsibility of the Project Manager.

4.08 The project implementation schedule is shown in Chart 9324. The Department will be responsible for specifying the sequencing of events and exact steps involved in executing each aspect of the Department's work, including allocation, orientation and self-help shelter development. This exercise constitutes a practical and effective orientation of Department staff.

4.09 The Project Department will be integrated with the Council's reorganized Housing Department following the Study of the existing NCC housing operations (para 3.08). It is expected that the study will be completed no later than June 30, 1976. Within six months after completion of the study, NCC shall prepare and put into effect a plan to reorganize the Housing Department and merge it with the Dandora Project Department.

## C. Allocation [1/]

4.10 Except for Option C lots which will be sold at market prices, only applicants with monthly household incomes of less than K Sh 650 (US$90) will be eligible for lots in the project. The cheapest lots (Option A, representing 65% of the total) will be allocated to families earning between K Sh 280 and K Sh 500 per month. The next category (Option B, representing 30% of the total) will be allocated to families earning K Sh 450 to K Sh 650 per month. The overlap in the two categories (i.e., between K Sh 450 and K Sh 500 per month) allows for improvement in income. An additional 5% of the lots including demonstration units (Option C) will be sold at market prices in order to encourage a wide mix of income groups in the scheme and to cross-subsidize the costs of approximately half of the lots, all in Option A. The per lot subsidy, estimated at about K£ 55 represents approximately 20% of the Option A lot development cost (see Annex 9, table 2).

4.11 The criteria for eligibility -- in addition to the monthly income requirements of K Sh 280 to K Sh 650 -- are that the applicant:

(a) have at least two years residency in Nairobi;

(b) be head of a family residing in the city; and

(c) have no other residential property in Nairobi.

4.12 Allocation will be done within the Project Department by a computerized random number program. NCC has a well functioning though under-utilized computer facility. A waiting list will also be selected in the same manner for lots not taken up by the original allottees or those taken over by the Department should the original owners fail to fulfill their obligations (see para 4.15). In order to ensure public confidence in the selection procedures and to insulate them from political pressures, each step in the process will be well publicized. A list of certified applicants and their application numbers will be posted prior to final selection, and a similar list of allottees or prospective tenants and those on the waiting list will be made public as soon as selection is completed.

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1/ This section is a schedule to the Project Agreement.

## D. Tenure, Lot Transfer and Eviction [1/]

4.13 Land ownership will be retained by the Government of Kenya; occupants will be given a 50-year lease. Allottees will be expected to reside on the lot but may rent rooms to lodgers. Sub-letting of rooms should allow the project to reach even lower income groups and to consolidate more rapidly. The lease will require an acceptable structure to be erected on the lots and specify the period within which it should be built.

4.14 In order to minimize speculation, NCC will act as intermediary in any sales or transfer of Option A and B lots for the first five years after individual allocation. Tenants wishing to sell or transfer lots will return them to NCC in return for compensation for improvements (cost of materials plus an imputed cost of labor). NCC would then offer the lot to households on the waiting list at a price which covers both the existing mortgages and the improvements. At negotiations, NCC agreed to prohibit each tenant from selling, transferring or otherwise disposing of his rights to tenancy except to NCC until the fifth anniversary of his lot occupation, and that fair compensation would be paid.

4.15 Standard NCC clauses enabling the Project Department to repossess the lots and any buildings on them in cases of default will be written into the mortgage agreement. In the event that an allottee accumulates a two-month arrearage, a warning notice will be issued. The appropriate community development personnel would be notified in order to help the allottee find a means of paying off his obligations. Should the cumulative delinquency reach four months, a final warning will be issued indicating that failure to reduce such delinquency within a specified period will lead to eviction. If no improvement is made, an eviction notice would ensue at the six-month point allowing the occupant an additional four weeks to vacate. This notice will be signed by the Project Manager or by the Director of the Housing Department when the Unit is merged with the latter. Recourse to the courts will not be necessary for enforcement of eviction. At negotiations, NCC reaffirmed its intention to evict and terminate the leasehold rights of any tenant who becomes six months delinquent in monthly payments for materials and lot loans.

# V. COST RECOVERY AND PRICING

5.01 The sources of funds for the project is shown in para 3.17. The Borrower will be the Government of Kenya which will on-lend both the US$8.0 million IDA credit and the US$8.0 million Bank loan to Nairobi City Council at 8-1/2% interest for 25 years, including a grace period of 4 years. The Government of Kenya will lend its contribution to NCC on the same terms as

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1/ This section is a schedule to the Project Agreement.

the National Housing Corporation (NHC) lends to other local authorities of 6.5% over 25 years. The NHC terms are part of established Government policy on lending to municipal areas.

5.02 Cost Allocation: As no standardized policy of housing charges presently exists in Nairobi, a new system has been devised which ensures that the project will be largely self-financing and therefore replicable. Total project costs have been allocated between NCC and plotholders as shown in Table 1 of Annex 9. The city will bear those costs typically recovered through utility tariffs, user fees and property rates such as trunk infrastructure, on-site water reticulation, tarmacing of bus routes, community facilities including related land development and servicing costs, technical assistance and landscaping. Land reserved for commercial undertakings and small industries bear part of the servicing costs on the basis of assignable costs. Such land will be turned over to the Commissioner of Lands who will lease it to individual entrepreneurs at market rents. Costs charged directly to lot holders include site preparation, lot demarcation, and on-site infrastructure attributable to residential use (roads, sewerage, street lighting, and a share of refuse collection facilities) and full costs of core units and materials loans. During negotiations it was agreed that NCC will recover from tenants essentially the following: 90% of the total cost of site preparation, 50% of the total cost of on-site infrastructure, 100% of the costs of core units and building materials loans, and 100% of design and engineering fees associated with the above items. In addition, a surcharge ammounting to 5% of the above items will be made as a risk reserve.

5.03 The costs of the Project Department will not be charged to the lot holders immediately for the following reasons:

(a) a substantial element of these costs represents the duplication of NCC responsibilities normally financed through Council general revenues; and

(b) other NCC housing beneficiaries currently escape most administrative costs. The study of NCC housing operations is expected to develop a system for charging occupants of NCC rental housing, tenant purchase housing and site and service units (including the beneficiaries of this project) for administrative costs.

5.04 Charges to Lot Holders: Except for the 330 units which will be sold at market prices, lots are priced on the basis of actual costs in order to reach low-income households. The infrastructure costs discussed in para 5.02 including site preparation, design and engineering costs and interest during construction would be charged to lot holders on the basis of cost per square meter. Beneficiaries will be able to choose between six options which differ by lot size and the type of core unit. Thus, three lot sizes

will be offered with a built serviced wet core (Option A), and the same three lot sizes with a complete first room (Option B). A limited number of two-room units (Option C) will be available in one lot size only and sold on the open market.

5.05 Charges reflect the following terms to households: an interest rate and maturity of 8.5% over 30 years under Option A, and 8.5% over 20 years for Option B. These terms were agreed at negotiations. The rate of interest is between prevailing market rates (about 9%) and the rate currently charged on NCC housing (7.5%). Two maturities have been chosen to reflect the differing requirements of each option towards materials financing and to introduce a wider spread between monthly payments on the two options (Annex 9). Allottees will be required to make a down payment of K Sh 550 including a deposit of K Sh 400 and K Sh 150 for water supply and sewer connection fees. This amount constitutes between 5% and 9% of lot costs.

5.06 Material loans are included for up to K£ 240, sufficient to build two rooms. Repayments are based on the same terms as lot preparation, servicing and core units, with a 5-year grace period for Option A. These terms were agreed at negotiations. Allottees may take any amount up to the maximum. Materials loans will be paid in cash according to the following formula: drawings of loan funds may be made in amounts up to the K Sh400 for the dwelling deposit plus the value of materials in the house on the lot subject to approval by the Project Department. All allottees will be qualified to borrow in this way, up to K£ 240 or K£ 120 depending on whether they are in Option A or B (see Annex 8).

5.07 The charge shown for land rent reflects Kenya's present land policy. All assignable land is leased from the Commissioner for Lands and Settlement for 3% of unimproved value for 10 years and 5% thereafter. Only the imputed rental for the residential area is to be recovered from lot holders. A risk reserve against bad debts will be established at 5% of monthly mortgage payments. This amount is considered adequate to cover the small loss incurred on delinquent payments and default assuming there is an efficient collection machinery, and that eviction procedures are enforced (see para 4.15).

5.08 A grace period of 5 years on building materials loans will be extended to allottees of Option A in order to encourage faster consolidation. This was agreed at negotiations. The grace period will not apply however, to occupants of Option B since they will have one-room core units from the beginning and would be borrowing only one room's worth of building materials. The interest foregone for Option A during the grace period would be capitalized and the full amount repaid over 25 instead of 30 years.

5.09 The expected monthly payments for each option are as follows:

Monthly Charges 1/

(K Shillings)

| Item | A (100 m2) | A (120 m2) | A (140 m2) | B (100 m2) | B (120 m2) | B (140 m2) |
|---|---|---|---|---|---|---|
| Total number of lots | 1,225 | 1,420 | 1,225 | 570 | 660 | 570 |
| Lot preparation, servicing and core units | 37 | 40 | 52 | 83 | 87 | 90 |
| Risk reserve (5%) | 2 | 2 | 3 | 4 | 4 | 5 |
| Land rent 2/ | 4 | 4 | 5 | 4 | 4 | 5 |
| Sub-total - Lot mortgage | 43 | 46 | 60 | 91 | 95 | 100 |
| Rates 3/ | 6 | 7 | 8 | 6 | 7 | 8 |
| Utilities 4/ | 24 | 24 | 24 | 24 | 24 | 24 |
| Sub-total - Mortgage plus utilities | 73 | 77 | 92 | 121 | 126 | 132 |
| Building materials loans | 0-54 | 0-54 | 0-54 | 0-21 | 0-21 | 0-21 |
| Total Range: | | | | | | |
| First five years 5/ | 73 | 77 | 92 | 121-142 | 127-147 | 132-153 |
| Thereafter | 73-127 | 77-131 | 92-146 | 121-142 | 127-147 | 132-153 |

1/ Including physical contingencies of 15% on infrastructure and 5% on buildings, design and engineering fees of 10% and interest during construction. Down-payments of KSh400 have been deducted from the principal of all lots, and a further K£55 in cross subsidies from the costs of about half the lots--all in Option A.

2/ Based on 3% of unimproved site value.

3/ Based on a 4.5% of unimproved site value.

4/ Based on tariffs effective January 1, 1975; utilities payments for project participants would be expected to rise in accordance with the overall tariff structure.

5/ During first five years Option A lot holders enjoy a grace period for the material loan.

5.10 Affordability: Based on the above charges and assuming expenditure for shelter and services of roughly 25% of household monthly income, a monthly income of about K Sh 280 would be required for the cheapest lot in Option A. A target income group of K Sh 280 to K Sh 500 has therefore been set for this option and a target of K Sh 450 to K Sh 650 for Option B. The monthly payments for Option A will experience a one-time jump at the end of the five-year material loan grace period. However, by that time the affected households should have a somewhat higher income and will have consolidated enough to allow at least one room for subletting. Extensive subletting now takes place in Nairobi's low-income housing areas with room rentals averaging between K Sh 100 to K Sh 150 per month.

5.11 At 1974 estimated income levels, Option A lots constituting two-thirds of the project would be affordable by households as low as the 20th percentile in the city's income distribution curve. Option B lots constituting the remaining third of the project would be affordable by households in the second quintile in the income scale with most of the lots going to households between the 30th and 40th percentile.

5.12 Project Cash Flow: The expected flow of funds generated by the residential component 1/ (Annex 9) shows a cumulative surplus ranging from K£ 25,000 (US$70,000) to K£ 380,000 (US$1,064,000) during the first ten years of the project. The sale price of Option C units, estimated at K£ 1,200 is critical to the realization of this surplus. However, even if the profit on these units was reduced to half that expected, the cumulative account would only experience a deficit of K£ 15,600 (US$42,560) in 1982 which would be eliminated by 1984.

5.13 The non-revenue producing project items (Annex 9, Table 4) comprising community facilities, technical assistance and maintenance of infrastructure will increase the projected deficit on NCC's general fund by about K£ 50,000 in 1976 rising to about K£ 380,000 by 1980 (Annex 10, Tables 3 and 4). The precarious state of NCC's general revenue fund and the steps being undertaken by Government to deal with this situation have been discussed in paras 2.06 and 2.15.

## VI. JUSTIFICATION AND ECONOMIC BENEFIT

6.01 The project, as a precursor of other site and service projects in Kenya including Nairobi, is expected to have substantial influence on the

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1/ Excludes trunk infrastructure, community facilities and technical assistance. The costs of water supply and sewerage will be carried by NCC's Water and Sewerage Department whose charges are intended to yield a certain rate of return on assets for water supply and to cover operation, maintenance and debt service for sewerage (see Annex 6). The roads, community facilities and technical assistance are covered by property rates and Government subventions.

Government's approach to urban shelter and infrastructure for lower income groups. It should demonstrate the feasibility of large scale self-help schemes which can lead to significant reductions in public investment required to serve the rapidly expanding urban population. The project would also include studies designed to formulate future projects consisting of both site and services and squatter upgrading, as well as strengthen the financial base and housing implementation capability of local government.

6.02 The project is expected to generate a wide range of benefits including improved living conditions for at least 6,000 households and increased output in the small-scale construction industry for self-help. Furthermore, the project should have substantial redistributive effects by directing NCC resources into site and services instead of conventional housing units which have ordinarily gone to the middle and upper income groups.

6.03 The most readily quantifiable benefits have been measured in terms of a stream of imputed market rental values over 40 years for the dwellings to be constructed under the project. The rents have been assumed at K Sh 120 per room per month based on data from studies of existing low-income areas. The costs include land costs (market value), on-site infrastructure and house construction, and maintenance. Labor input for house construction has been shadow priced by a factor of 25% in view of the relatively high unemployment rate in Nairobi of about 13% for the city as a whole and up to 20% for squatter areas and the fact that much of the work on self-help housing is typically done by persons who are not part of the active labor force. The project's rate of return is about 19%. Reducing the imputed rents by 25% i.e. to K Sh 90 per room still yields a rate of return of about 14.6%.

6.04 The justification for the sewerage component is presented in Annex 6. The economic rate of return is estimated at about 15.5%. In addition, the component will significantly reduce pollution in the Nairobi River where large amounts of excess raw sewerage are being dumped at present. The water further downstream of Nairobi has a number of possible uses including drinking, irrigation, and recreation associated with tourism (Annex 6).

6.05 Risks: The implementation schedule is considered realistic. However, other projects in the region have experienced delays due primarily to staffing problems. Specific efforts have been made to avoid this (para 4.04 and 4.07) and recruitment of staff is already underway. Should delays occur nonetheless, the result would probably be some increase in project costs. This might shift the project's target income groups slightly upward but not to the extent of jeopardizing the basic project objectives of demonstrating the suitability of this approach and providing shelter for low-income households in Nairobi. A second area of risk involves the rate of defaults on project mortgages and building materials loans, as there has been no directly comparable prior experience in Nairobi. If higher than anticipated in the risk reserve (para 5.09), any resulting project deficits would have to be met from NCC general funds.

## VII. RECOMMENDATIONS

7.01 The main agreements reached at negotiations were that NCC will:

(a) not engage in substantial demolition of unauthorized dwellings in areas subject to its jurisdiction (para 2.13);

(b) no later than September 30, 1975 submit to the Bank a plan for reorganization of its Water and Sewerage Department. NCC also agreed to impose suitable sewerage charges to cover operating costs and to meet periodic repayments and interest and other charges on long term indebtedness incurred for its sewerage operations (para 4.01);

(c) execute the major part of the project through a Dandora Project Department reporting solely to a Committee established by NCC to oversee the implementation of the project (para 4.03 and 4.04);

(d) furnish to the Bank

(i) provisionally audited project accounts and financial statements promptly after the end of each fiscal year but in any case not later than six months after the end of such year (para 4.05);

(ii) unaudited NCC accounts and financial statements not later than six months after the end of each fiscal year (para 4.05);

(iii) audited accounts and financial statements including those of the project, audited in accordance with sound financial principles and by an independent auditor acceptable to the Bank, as soon as available but in any case not later than nine months after the end of each year (para 4.05);

(e) undertake a study of the Council's Housing Operations to be completed no later than June 30, 1976 and no later than six months after completion of the study, prepare and put into effect a plan for the reorganization of its Housing Department and the integration of the Dandora Project Department with the reorganized Housing Department (para 4.09);

(f) grant tenants leases for a term of fifty years, which will permit them to sublet rooms (para 4.13);

(g) recover from tenants essentially the following: 90% of the total cost of preparation of the project site, 50% of the total cost of infrastructure, 100% of the total costs of core units and other structures constructed on plots by NCC, and 100% of design and engineering fees associated with the above items (para 5.02). The repayments terms of plot loans and materials loans are to be 8-1/2% interest and 20 or 30 years for Option B and A lots respectively (paras 5.05 and 5.06);

(h) prohibit each tenant from selling, transfering or otherwise disposing of his rights to tenancy except to NCC until the fifth anniversary of his lot occupation, and pay fair compensation on reacquisition (para 4.14); and

(i) evict and terminate the leasehold rights of any tenant who becomes six months delinquent in monthly repayments for materials and plot loans (para 4.15).

7.02 The main agreements with the Government of Kenya were that it will:

(a) undertake a study of municipal finance in Kenya with the assistance of the IMF or other experts acceptable to the Bank (para 2.06);

(b) K£ 4.82 (US$13.50) million financing contribution toward the project the bulk of which is to be on-lent to the Nairobi City Council at a rate of interest of at least 6.5%, equivalent the normal rate charged by Government sources for Municipal Housing Projects (paras 3.16 and 5.01);

(c) on-lend IDA/Bank funds to NCC at 8.5% and 25 years including a 4-year grace period (para 5.01);

(d) provide NCC, or enable NCC to provide itself, with funds adequate to meet its reasonable recurrent and development expenditure until such time as NCC through the implementation of the results of the IMF assisted local finance study or otherwise no longer nequires such assistance (para 2.15);

(e) employ consultants to undertake the preparation of a detailed site and service and upgrading program for Nairobi and at least two other towns in accordance with terms of reference acceptable to the Bank (para 3.08); and

(f) consult with the Association prior to making any substantial changes in its policies regarding squatters (para 2.13).

7.03 With the assurances indicated above, the project is suitable for a credit uf US$8 million equivalent on standard IDA terms and a loan of US$8 million equivalent for a term of 25 years including a grace period of 4 years.

KENYA

APPRAISAL OF A SITE AND SERVICE PROJECT

## The City of Nairobi: A Planning Context 1/

### A. Population, Employment, Income

1. The past and projected population of Nairobi is presented below:

Nairobi Population

| | 1962 2/ | 1969 2/ | | 1971 3/ | | 1975 3/ | | 1980 3/ | |
|---|---|---|---|---|---|---|---|---|---|
| | Total | Total | %Change p.a. | Total | %Change p.a. | Total | %Change p.a. | Total | %Change p.a. |
| Africans | 231,744 | 422,912 | 9.0% | 502,500 | 9.0% | 682,300 | 7.8% | 969,600 | 7.3% |
| Asians | 86,922 | 67,189 | -3.8% | 64,000 | -2.5% | 61,200 | -1.1% | 57,900 | -1.1% |
| Europeans | 28,765 | 19,185 | -6.0% | 18,700 | -1.2% | 19,500 | 1% | 20,500 | 1% |
| Total | 347,431 | 509,286 | 5.6% | 585,200 | 6.8% | 763,000 | 6.8% | 1,048,000 | 6.6% |

1/ Sections A through C of this Annex rely heavily on the Nairobi City Council's Nairobi Metropolitan Growth Strategy also known as the Urban Study.

2/ Census year.

3/ Nairobi City Council projections (see Nairobi Metropolitan Growth Strategy, Vol. II, Appendix 1).

2. In 1969 Nairobi's region -- some 12,000 $m^2$ had a population of about 1,344,000. Nearly 810,000 lived in predominantly rural areas and the remainder in Nairobi (509,000) and small urban centers such as Thika and Machakos. Projections show that by the end of the century, the region is likely to contain about 4 million people or 13% of the expected national total.

3. In 1967 the last year for which data is available, Nairobi's GDP was put at K£119 (US$333) million and employment at 171,500. Unemployment was estimated at about 13%. Since then it is estimated that the city's GDP has been and will continue to grow at between 7.6% and 8.5% annually and employment at between 3.3% and 5%. This compared to about 7% annual growth in Kenya's GDP between 1964 and 1970 and employment growth of about 2%. Accordingly GDP is forecast to be K£474 (US$327) million in 1985 and £1,322 (US$3,701) million in 2000. Employment would be about 523,000 and 646,000 respectively. However, unemployment is expected to grow worse.

4. The existing and projected income distribution for the city is shown in Table 1.

## B. Nairobi Physical Plan

5. The above information on population, employment, income and its distribution, formed the context within which a broad physical structure for the city to year 2000 was formulated. The standards and land requirements used were: a gross residential density of 100 persons per hectare for housing areas and 50 workers per hectare for major employment centers. It was assumed that land demand for commercial areas would remain small.

6. Three metropolitan growth concepts formed the basis for formulating possible urban growth strategies.

- accretion at periphery of built-up areas.
- linear development along transport corridors.
- limiting growth of central city and initiating development of satellite towns.

The alternatives resulting from these concepts were then evaluated based on their performance regarding movement, accessibility, adaptability etc. The evaluation was carried out in three cycles and resulted in the choice of a linear form linking Nairobi to Thika with some accretion around Athi River (see Map 11068). Based on this long-term strategy, a medium term plan (1985) was then defined.

## C. Urban Study Recommendations on Major Aspects of Urban Growth

7. The Nairobi Urban Study then formulated a series of recommendations relating to various aspects of urban growth such as employment, transport, housing and other services. These recommendations were seen as creating a context for possible investment programs to be carried out within the context of the above physical plan.

Employment. With respect to employment, the study recommended both direct and indirect action by the City. Important among them were deregulating and promotion of informal sector activities, vocational training, and provision of better job market information through more efficient labor exchanges.

Housing. The City was urged to formulate a shelter program based on standards that inhabitants can afford in order to minimize housing subsidies, to promote the use of local building materials and unskilled labor, and to emphasize self-help. The study also underscored the need to encourage a greater flow of private capital into housing and to promote squatter upgrading and site and services.

Transport. The study recommended a movement system based on a policy of minimizing capital investment by locating workers houses near employment, and developing a cheap but efficient system of public transport such as busways.

Administration. Lastly, the study recommended a strengthened NCC department to ensure continuous comprehensive urban planning, the setting up of a City Housing Agency responsible for formulating and executing a shelter policy and program, and the strengthening of the budgetary system in the Council.

## D. Nairobi City Council: Structure and Operations

8. The Council has 40 elected councillors and 3 nominated members who represent special interests. The Provincial Commissioner represents the Provincial Administration, and the East African Community and the Neighboring Kiambu County Council each nominate one member. The elected councillors serve four-year terms and may be re-elected. At a special meeting held each August the councillors elect Nairobi's Mayor, who serves a two-year term, and Deputy Mayor, who serves for one year. The mayoralty is not an intrinsically powerful position. Although the Mayor presides over meetings of the full Council and may cast a tie-breaking vote, most of the responsibilities associated with the job are essentially ceremonial.

9. The Council composes itself into eight standing committees responsible for specific functions. The standing committees are:

(a) General Purposes Committee

(b) Finance Committee

(c) Housing and Social Services Committee

(d) Public Health Committee

(e) Works and Town Planning Committee

(f) Staff Committee

(g) Water and Sewage Committee

(h) Education Committee

The General Purposes Committee is in many respects the most important committee; it discusses major policy questions and is composed of the Mayor and Deputy Mayor, who act as its chairman and vice-chairman, and the chairmen of the other committees, as well as several other members. Most of the committees also appoint sub-committees to handle specific matters.

10. Because there are so many committees and meetings are often long, the Council's senior officers devote a very large proportion of their time to committee matters. Under the current division of responsibility, any particular project is likely to fall under the jurisdiction of several committees and officers find that they must present proposals repeatedly and secure authorization from a number of committees before projects can be implemented.

11. In 1971, the City Council's administrative staff consisted of 12,757 employees, as follows:

| | |
|---|---|
| Salaried staff | 3,850 |
| Wage staff | 5,271 |
| Teachers | 1,965 |
| Casual workers | 1,671 |
| | 12,757 |

Staff members work for seven departments, which are headed by a Town Clerk, City Treasurer, City Engineer, General Manager of the Water and Sewerage Department, Medical Officer of Health, City Education Officer, and Director of Social Services and Housing. The sections within each Department are listed in Table 2 which indicates the types of functions performed by each department. City Council has had a difficult time securing qualified staff members to fill all of its approved positions. Most of the departments have only been able to fill 80 to 90% of their approved positions. These difficulties are due to the shortage of skilled Kenyan technicians coupled with the relatively low salaries in NCC compared to Central Government and the private sector. In 1972, NCC reduced the gap between its salaries and those of Central Government by about two-thirds. In spite of this improvement, NCC still relies heavily on non-citizens for certain technical skills. In addition to hiring non-citizens locally, the Council recruits expatriates from abroad. In order to attract expatriates, the Council provides a variety of expensive benefits, such as transportation, subsidized housing, and other gratuities. Some technical workers are also supplied through bilateral assistance programs. The City Engineer's and City Treasurer's Departments are particularly dependent on foreign skills. In the Engineer's Department in 1972, 77% of the staff in four technical grades were non-citizens; in the Treasurer's Department 71% of the staff at senior levels were not Kenyans.

Relations between NCC and the National Government

12. The parent ministry for the NCC, as well as Kenya's other local authorities, is the Ministry of Local Government which has broad powers of control over the City Council. The most important of these concern finances. The Minister must approve the Council's budgets, including the number and salaries of employees, and the scale of fees charged to the public for Council services. Furthermore, the Minister has the power to audit the Council's financial records and has broad powers of control over a wide range of administrative matters.

13. The City Council regularly comes into contact with almost all of the other Government ministries. For example, the City Education and Public Health Departments are both subject to the regulations and control of the corresponding national ministries. Much of the Council's finance for housing projects is obtained from the National Housing Corporation, the executive arm of the Ministry of Housing. The Council's Town Planning Section liaises closely with the Commissioner of Lands and the Department of Urban and Rural Physical Planning in the Ministry of Lands and Settlements over questions concerning the use of land in Nairobi. The City Treasurer's Department negotiates with the Ministry of Finance and Economic Planning over the amount, terms, and timing of its issues of bonds.

14. Nairobi's national importance and the fact that responsibility for governing the city is shared among so many agencies encouraged the Local Government Commission of Inquiry (1966) to recommend the establishment of a

development authority for the Nairobi metropolitan region. The Government accepted this recommendation and a Nairobi Development Committee was set up composed of Permanent Secretaries from eight ministries, the Nairobi Provincial Commissioner, and the City Council's Chief Officers, under the chairmanship of the Permanent Secretary of the Ministry of Local Government. The committee met only a few times and then ceased to exist. Proposals are currently being considered for the establishment of a new inter-governmental committee to coordinate governmental programs in Nairobi.

15. Relations between NCC and the Central Government are becoming increasingly strained. This appears to reflect uncertainty about the future role of local, especially municipal, Government in Kenya. The immediate source of dispute is municipal finances; Government has not only been unwilling to approve the level of spending requested by Council, but has also not indicated how much money will be available in the medium term. In this as in other areas, Government does not appear to be providing an adequate policy guidance for NCC activities. It is hoped that the proposed IMF assisted municipal finance study will accelerate the resolution of these problems.

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Annual Household Income: 1972, 1985 and 2000

| | 1972 | 1985 | 2000 |
|---|---|---|---|
| Nairobi, Total Income of Households | £ 164,000,000 | £ 474,000,000 | £ 1,322,030,000 |
| No. of Households | 135,730 | 324,000 | 670,000 |
| Lowest 20% of Households | | | |
| Share of Total Income | 3.5% | 2.8% | 2.5% |
| Amount | £ 5,740,000 | £ 13,272,000 | £ 33,050,000 |
| Average Income per household | £ 214 | £ 208 | £ 247 |
| Low-Middle, 20—40% | | | |
| Share of Total Income | 6.8% | 8.7% | 11.0% |
| Amount | £ 11,152,000 | £ 41,238,000 | £ 145,420,000 |
| Average Income per household | £ 413 | £ 636 | £ 1,085 |
| Middle, 40—60% | | | |
| Share of Total Income | 13.0% | 14.1% | 17.0% |
| Amount | £ 21,320,000 | £ 66,834,000 | £ 224,740,000 |
| Average Income per household | £ 777 | £ 1,027 | £ 1,677 |
| Upper-Middle, 60—80% | | | |
| Share of Total Income | 21.3% | 21.4% | 24.5% |
| Amount | £ 34,932,000 | £ 101,346,000 | £ 323,890,000 |
| Average Income per household | £ 1,286 | £ 1,560 | £ 2,417 |
| Highest 20% of Households | | | |
| Share of Total Income | 55.4% | 53.0% | 45.0% |
| Amount | £ 90,856,000 | £ 251,220,000 | £ 594,900,000 |
| Average Income per household | £ 3,352 | £ 3,869 | £ 4,440 |
| All Households | | | |
| Average Income per household | £ 1,208 | £ 1,460 | £ 1,973 |

1971 prices

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APPRAISAL OF A SITE AND SERVICE PROJECT

Departments and Sections of the Nairobi City Council

Town Clerk's Department

- General Administration
- Litigation
- Contracts and Conveyance
- Organization and Methods
- Central Registry
- Valuation and Rating
- Central Printing Unit
- City Hall Administration and Restaurant
- Court of First Class Magistrate
- Prosecution Office
- Licensing
- City Inspectorate
- Dog Pound

City Treasurer's Department

- Accountancy
- Revenue
- Audit
- Costing
- Cash Office
- Computer Center
- Graduated Personal Tax
- Collection
- Purchasing
- Stores
- Establishment
- Training

City Engineer's Department

- Central Administration
  - Design and Development
  - Estates and Development
  - Roads
  - Architecture
  - Quantity Surveying
  - Town Planning
- Operations and Maintenance
  - Building Works
  - Electrical
  - Parks
  - Transport
  - Highways
  - Fire Service

Water and Sewerage Department

- General Administration
- Water Supply Planning
- Water Supply Maintenance
- Sewerage Planning
- Source Works and Reservoirs
- Sewerage Maintenance
- Water Stores
- Commercial

## Departments and Sections of the Nairobi City Council

### Public Health Department

- Health Inspectorate
- Innoculation Center
- Communicable Diseases Control
- Cleansing Services
- Maternity and Child Welfare
- Dispensary Service
- Day Nurseries
- Registration of Births and Deaths
- Funeral Service

### City Education Department

- General Administration
- Primary School Service
- Schools Advisory Service
- Supplies and Meals Service
- Special Schools Unit

### Social Services and Housing Department

- General Administration
- Welfare and Recreation Unit
- Family Welfare Services
- Hostels
- Library Service
- Trading Centers Unit
- Housing Administration

# KENYA

## APPRAISAL OF A SITE AND SERVICE PROJECT

### Housing Development in Nairobi

### A. Housing Stock and Output

#### The Private Sector

1. The supply of housing in Nairobi is from three sub-sectors: the private formal, the private informal, and the public. In 1970 roughly one-third of Nairobi's population lived in housing supplied by the private formal sub-sector. Although precise data on the private housing sector in Nairobi are not available, virtually all of the units built by this sub-sector range upwards of KSh 100,000 (US$14,000). Output dropped sharply during the early and mid-1960s, caused mainly by the uncertainty felt by many Asian skilled workers and supervisory staff. Table 1 indicates the magnitude of the slump, which bottomed out in 1965 when the total floor area of residential construction was only 7% of what it had been in 1957. By the early 1970s this sub-sector began to reach the level of output attained more than a decade earlier, when Nairobi had less than half its present population of 730,000—although the population and income mix have changed substantially. Although data on the number of units built each year is not available, it is estimated that the private formal sub-sector has produced a little over 1,000 units annually in recent years. The significant drop in units completed in 1973 was due to shortages in supplies of imported building materials and distribution problems of local materials, notably cement.

2. In addition to medium- and high-cost housing, this sub-sector's contribution to Nairobi's housing stock includes staff and servant's quarters provided by employers and old Asian extended family dwellings which have been converted into tenements. Overcrowding is a severe problem in many of these tenements.

3. Informal or popular housing (uncontrolled and squatter housing) activities are a response to the failure of the private formal and public sub-sectors to supply enough housing at sufficiently low prices to meet the needs of Nairobi's rapidly growing populace. A 1971 study concluded that one-third of the city's inhabitants were living in uncontrolled, illegal housing. Squatting has occurred in a variety of settings. In the central city, for example, people build flimsy structures along the valley of the Nairobi River at night and dismantle them the next morning. The original squatter villages in Mathare Valley provide an excellent example of this form of settlement on the edge of the city's developed core, and there are

an additional 48 squatter concentrations located within the municipal area. With the exception of Mathare Valley, the civic authorities have until recently pursued a policy of demolishing squatter developments in the built-up areas of the city without rehousing the people.

4. Popular housing development has also occurred on land owned by developers, e.g., "companies" in eastern Nairobi. Under this organizational form, which originated in Mathare Valley, shareholders develop sub-plots on land purchased by the "company". The housing consists mostly of wooden barracks with four to six rooms, which are rented separately; the level of services is usually substandard or nonexistant. Company housing proved to be a highly profitable investment, with annual returns of up to 100% reported in several cases. Within only a few years of their inception, the companies built housing for roughly 10% of Nairobi's population.

5. Another form of popular housing on land owned by the developers occurs in Dagoretti in western Nairobi. Dagoretti was part of the African reserve during the colonial period and individual landowners have strong social and cultural ties to the area. Many of the landowners responded to Nairobi's housing shortage and the area's proximity and good transportation links to the city center by building rental housing without the approval of the civic authorities. Most of the units are timber barracks similar to those built by companies, although the densities in Dagoretti are much less than those in Mathare Valley and other company developments in eastern Nairobi. As a result Dagoretti's population doubled during the 1960s, and its eastern half changed from predominantly agricultural area to a mixed pattern of semi-urban settlement. By the early 1970s Dagoretti provided accommodation for just under 10% of Nairobi's population.

The Public Sector

6. At the beginning of the 1970s slightly less than a third of Nairobi's population lived in public housing supplied by Nairobi City Council and the National Housing Corporation. The latter is a parastatal body which acts as the Executive arm of the Ministry of Housing. Together, the two authorities provide practically all public housing units in Nairobi, but with the latter directly building only a small part of the total and mostly in the higher cost brackets (see Table 2). Various firms, E.A. Railways Corporation and other public institutions add a small number of staff housing each year to the Nairobi housing stock, but Government Ministries are no longer supposed to build staff housing in Nairobi.

7. Nairobi City Council is the public body with primary responsibility for low-cost housing in Nairobi. The Council's housing program is fainanced from three sources: (a) in recent years roughly two-thirds of the capital expenditure on housing has come from NHC; (b) the Council also raises money by issuing bonds on the local market; and (c) by negotiating loans directly with CDC and AID.

8. The City Council's housing program underwent a dramatic expansion during the late 1960s. Table 3 summarizes the program from 1964 to 1971. The bottom line of the table indicates that the housing portion of the Council's total capital expenditure rose from roughly one-third during the mid-1960s to just under two-thirds by the end of the period. The table also illustrates the growing importance of tenant purchase schemes, which absorbed two-thirds of housing expenditure by 1970. Most of the funds devoted to redevelopment were spent on the Pumwani scheme. Although 660 new apartments were built in this scheme, the high cost of the new units made it impossible to rehouse many of the residents of old Pumwani and only a few of the old Swahili-style houses scheduled for demolition were in fact torn down. The improvement of old housing estates built during the colonial era is no longer as important an activity for the Council as it was in the immediate aftermath of Independence. Only 3% of capital expenditure on housing during this period was used for sites and services schemes.

9. Information on the types of housing produced by the City Council during three different periods of time is summarized by groups according to monthly charges in Table 4. The most striking feature is that almost all of the inexpensive Council housing in use at the beginning of 1971 was inherited from the pre-Independence period. Thus, of the 13,751 units which had charges of less than 108 shillings per month, 12,934 or 94% were built before 1964. Of the 5,066 units built between 1964 and 1971, 42% had monthly charges of 108 to 188 shillings, 22% fell in the 189 to 269 shillings range, and 20% cost more than 270 shillings a month. The units built before and after Independence are not directly comparable because of the rise in building costs and because the colonialists emphasized the provision of minimal accommodation for African laborers rather than family units.

10. The rate of housing construction by Nairobi City Council reached an average of approximately 1,000 a year in 1968-71. The building rate has since declined. If we combine NCC housing output with that of the NHC for these years, the average annual rate of output of the public sub-sector, approximately 1,300 units, was roughly comparable to that of the private formal sub-sector. The disparity between the production of approximately 2,300 approved units a year and an annual addition to households of some 9,000 suggests one reason why the informal sector housing development in Nairobi has been so vigorous in recent years.

11. Even though the actual amount of money spent on housing has increased over the years, it has diminished relative to total capital expenditure since 1969. Furthermore, there has been a tendency to move away from rental units to tenant-purchase houses, which cost considerably more than serviced sites (see Table 5). Not only is this contrary to National Housing Policy, but it adds to the relative shortage of housing Nairobi. The move away from rental units is understandable from the NCC's point of view, in that maintenance expenditure becomes the responsibility of the purchaser. This principle is, of course, also applicable to structures built in sites and services schemes, which have the added advantage of mobilizing private efforts and funds for construction activities.

12. There is much evidence that both rental and tenant-purchase housing built by the NCC is being sub-let in whole or in part. The allocation of publicly built units becomes a critical exercise, since the so-called "economic rent" charged for them is much lower than the market price for the same kind of accommodations. In fact, the rental units with three rooms are often sub-let at three times the official rent because each room is sub-let separately at the official rent. This situation makes such units a profitable asset.

13. Table 6 indicates the way in which the present housing stock is distributed among the three sub-sectors. The growth rate of the informal sector during the late 1960s was probably equal to that of the other two sub-sectors combined. This conclusion is deduced from the figures provided in Table 7 where population figures are confronted with housing statistics as far as they are available. The formal private sector in fact provided only about 10% of the total need in the last year recorded (1972).

14. The reason for the sudden increase in the activities of the informal private sector was not only the pressure of immigrants and the resulting economic attractiveness of housing investment, but also the related fact that at this time companies and cooperatives were organized on a large scale. Whether a group of persons registered their association under the Companies Act or as a cooperative made little difference to the way its business was conducted, but most groups found the company form less restrictive to their operation, which in some cases also included taxi-driving, retail-trading and restaurant-business. In the early 1970s practically all of the available lots in Mathare Valley were acquired and developed by companies, and other companies began to develop sites elsewhere in eastern Nairobi. The main constraint was the availability of land. Some companies were reluctant to develop their land in the absence of approval by public authorities. Since there are no plans for many of these areas, approval could not be obtained for even substantial houses. Instead some companies bought up existing housing units and converted them into one-roomed tenements.

## B. Public Housing Rents

15. Housing assumes an important place in Nairobi's overall municipal functions and currently accounts for about 13% of estimated current and 31% of estimated capital expenditure. Nairobi public housing stock falls into two categories: tenant purchase and pooled rental housing. Recently there has been increased emphasis on tenant purchase arrangements to encourage house ownership. The tenant purchase scheme, which started in 1969, now supports some 2,700 dwellings with a planned immediate growth to 3,000 units. In comparison, during the period 1964 to 1974 the pooled rental housing stock was increased by some 3,100 dwellings to a total of about 17,000 units (Table 4).

Pooled Rental Housing

16. The philosophy of pooled housing rent levels is to recover, year by year, the estimated costs of the service provision and management, part of the rent going towards annual contributions to a maintenance fund which then meets any repairs. The City Council has, however, not been able to implement this policy consistently. Until 1973, when rents were raised by an average of 42% pooled rental housing had been producing an increasing deficit which stood at about US$540,000 in 1972. The deficit necessarily meant a deteriorating situation on the maintenance fund.

17. The rent increases reduced the expected deficit in 1973 from ₤141,000 to about ₤11,000 and is expected to accrue a surplus in 1974 of about ₤260,000. This is to be applied to writing off the deficits incurred in 1973 (₤192,000) and 1974 (₤11,000) the balance ₤57,000 being transferred to the Maintenance Fund. This will provide adequate remedial support for the Fund and for the longer term, annual contributions are to equate to estimated expenses. While the level of rent income makes this possible the Fund will maintain a stable position. However the revised rent income will support the service for a limited period only.

18. It was judged that the revised level of rent income would prevent the pooled rental housing account from incurring a deficit until 1976, and at the same time provide funds for an adequate maintenance provision. In fact, expenditures for pooled rental housing have increased by about 9.75% a year whilst the maintenance element has been rising by about 20% a year and there are indications (increasing inflation in the cost of building materials and expected improvement in salaries of Council employees--salary costs represent about 75% of all NCC current expenditures) that higher ratio of increases in costs is probably appropriate. The table below projects the situation and indicates that without further rent review the following annual deficits are likely:

| | 1976 ₤ | 1977 ₤ | 1978 ₤ | 1979 ₤ | 1980 ₤ |
|---|---|---|---|---|---|
| A. Maintenance 20% ) Other 9.75%) | 65,000 | 240,000 | 450,000 | 680,000 | 940,000 |
| B. Maintenance 25% ) Other 12% ) | 141,000 | 375,000 | 647,000 | 964,000 | 1,335,000 |

19. By 1976-1977, another rent increase will most probably be required. The NCC Housing Operations Study will, inter alia, therefore have to review:

- the current basis for rental calculation with particular attention to the elimination of any regressive cross-subsidies to upper income groups.

- the gap, if any, between NCC housing and private sector rents.

- a possible mechanism for keeping rents under continual review in order to avoid extended deficits on the account.

Tenant Purchase Housing

20. As indicated above, the emphasis of housing activity has shifted to the assistance of owner occupation through a tenant purchase scheme. Through the scheme, some 3,000 dwellings have been built by the Council and are being sold under tenant purchase arrangements with a 5% deposit and mortgages of up to 25 years at about 7%. The growth experienced by the scheme demonstrates the investment in home ownership in line with Government policy. However, stimulus in this area is declining in accordance with the increasing financial constraint of loan finance.

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Private Residential Construction in Nairobi, 1957-1973

| Year | Number of Residential Buildings Completed | Total Floor Area '000 sq ft | Total Cost £'000 | Estimated No. of Units |
|---|---|---|---|---|
| 1957 | 442 | 1,552 | 5,046 1/ | |
| 1958 | 434 | 1,366 | 2,859 1/ | |
| 1959 | 491 | 1,663 | 3,171 | 832 |
| 1960 | 422 | 1,632 | 2,955 | 816 |
| 1961 | 68 | 333 | 687 | 166 |
| 1962 | 29 | 138 | 348 | 69 |
| 1963 | 47 | 133 | 394 | 66 |
| 1964 | 61 | 223 | 436 | 111 |
| 1965 | 29 | 113 | 310 | 57 |
| 1966 | 95 | 342 | 684 | 171 |
| 1967 | 187 | 560 | 1,402 | 280 |
| 1968 | 223 | 622 | 1,685 | 311 |
| 1969 | 249 | 1,311 | 2,521 | 655 |
| 1970 | 440 | 1,928 | 3,448 | 902 |
| 1971 | 483 | 2,404 | 4,800 | 1,170 |
| 1972 | - | - | - | 1,311 |

1/ Also includes expenditure on non-residential buildings.

Source: Statistical Abstract, Annual Volumes, Economic Survey 1974.

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Housing Construction in Nairobi by the National Housing Corporation, 1967-71

| Cost Range | Number of Units | % Units |
|---|---|---|
| £710 | 14 | 1.8% |
| £1,150 | 145 | 19.1% |
| £1,310 - £1,475 | 192 | 25.3% |
| £1,565 - £2,380 | 107 | 14.1% |
| £2,864 - £2,950 | 93 | 12.3% |
| £3,500 - £4,500 | 208 | 27.4% |
| | 759 | 100.0% |

Source: Annual Reports of the National Housing Corporation and data supplied by the NHC.

Note: For a few of the NHC's schemes with more than one house type, only average costs for the whole scheme were available. In a few other cases, only estimated costs were available.

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Nairobi City Council Capital Expenditure on Different Types of Housing Projects, 1964-71

(K£)

| Type of Project | 1964 | 1965 | 1966 | 1967 | 1968 | 1969 | 1970 | 1971 | Total |
|---|---|---|---|---|---|---|---|---|---|
| Tenant Purchase Schemes | -- | -- | 33,955 | 15,537 | 461,164 | 955,054 | 768,279 | 955,940 | 3,189,969 |
| % of annual total | 0.0 | 0.0 | 19.8 | 2.2 | 31.9 | 66.3 | 70.7 | 37.0 | 39.8 |
| Rental Schemes | 194,110 | -- | 15,914 | 231,535 | 325,480 | 137,494 | 158,941 | 1,019,370 | 2,082,844 |
| % of annual total | 50.9 | 0.0 | 9.3 | 33.7 | 22.5 | 9.5 | 14.6 | 39.5 | 26.0 |
| Rehabilitation & Redevelopment Schemes | 93,944 | 150,234 | 18,298 | 169,619 | 518,415 | 303,668 | 125,188 | 405,655 | 1,785,201 |
| %% of annual total | 24.6 | 69.3 | 10.6 | 24.7 | 35.8 | 21.1 | 11.5 | 15.7 | 22.3 |
| Site and Service Schemes | 43,427 | 13,182 | 15,644 | 3,380 | 75,345 | 15,908 | 629 | 591 | 168,106 |
| %% of annual total | 11.4 | 6.1 | 9.1 | 0.5 | 5.2 | 1.1 | 0.1 | 0.0 | 2.1 |
| Completion, Alternation & Upgrading of Pre-Independence | 15,818 | 49,514 | 32,163 | 161,785 | 28,127 | 25,596 | 20,097 | 45,635 | 378,735 |
| %% of annual total | 4.1 | 22.8 | 18.7 | 23.5 | 1.9 | 1.8 | 1.8 | 1.8 | 4.7 |
| Staff Housing | 33,787 | 2,630 | 34,607 | 102,166 | 38,971 | 761 | -- | 86,188 | 299,110 |
| % of annual total | 8.9 | 1.2 | 20.1 | 14.9 | 2.7 | 0.1 | 0.0 | 3.3 | 3.7 |
| Miscellaneous | 241 | 1,338 | 21,213 | 3,896 | -- | 1,798 | 13,358 | 69,200 | 111,044 |
| % of annual total | 0.1 | 0.6 | 12.3 | 0.0 | 0.0 | 0.1 | 1.2 | 2.7 | 1.4 |
| TOTAL | 381,327 | 216,898 | 171,834 | 687,918 | 1,447,502 | 1,440,279 | 1,086,492 | 2,582,579 | 8,014,829 |
| % | 100.0 | 100.0 | 99.9 | 100.1 | 100.1 | 100.0 | 99.9 | 100.0 | 100.0 |
| Housing as % of total capital expenditure | 34.9 | 36.4 | 15.1 | 33.4 | 55.9 | 66.3 | 65.3 | 62.9 | 52.0 |

Source: Analysis of data on housing expenditure from the Nairobi City Council's annual Abstracts of Accounts.

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APPRAISAL OF A SITE AND SERVICE PROJECT

Nairobi City Council Rental and Tenant Purchase Housing

| Monthly Cost 1/ | Rental Units Built Before 1964 | Rental Units Built 1964-67 | Rental Units Built 1968-73 | Tenant Purchase Units Build 1968-73 | Rental Units in Use 1.1.74 | Tenant Purchase Units in Use 1.1.74 |
|---|---|---|---|---|---|---|
| 32/- to 53/- | 6,214 (43.8%) | | | | 6,214 (31.6%) | |
| 54/- to 80/- | 1,422 (10.0%) | | | 67 (1.3%) | 1,422 (7.2%) | 67 (0.3%) |
| 81/- to 107/- | 2,836 (20.0%) | | | | 2,836 (14.4%) | |
| 108/- to 134/- | 145 (1.0%) | | | 698 (13.4%) | 145 (0.7%) | 698 (13.6%) |
| 135/- to 188/- | 2,688 (19.0%) | | 884 (17.0%) | 1,081 (20.7%) | 3,572 (18.2%) | 1,081 (5.5%) |
| 189/- to 269/- | | | | 458 (8.8%) | | 458 (2.3%) |
| 270/- to 377/- | 89 (0.6%) | | 312 (6.0%) | 449 (8.6%) | 401 (2.0%) | 449 (2.3%) |
| 378/- to 539/- | 109 (0.8%) | | 464 (8.9%) | 154 (3.0%) | 573 (2.9%) | 154 (0.8%) |
| 540/- to and over | 682 (4.8%) | 260 (100.0%) | 490 (9.4%) | 156 (3.0%) | 1,432 (7.3%) | 156 (0.8%) |
| **TOTAL** | 14,185 (100%) | 260 (100%) | 5,213 (100%) | | 19,658 (100%) | |

1/ The monthly rent for rental units and the monthly repayment, assuming the maximum 20-year loan, for tenant purchase schemes.

KENYA

APPRAISAL OF A SITE AND SERVICE PROJECT

Nairobi City Council Tenant Purchase Schemes, 1969-74

| Price Range of Units | No. of Units | |
|---|---|---|
| 9,500/- | 67 | |
| 16,000/- to 20,000/- | 1,255 | |
| 22,000/- to 28,500/- | 650 | |
| 31,500/- to 37,500/- | 436 | 1/ |
| 41,500/- to 51,000/- | 499 | |
| 60,000/- to 76,600/- | 307 | |
| | 3,214 | 2/ |

1/ All the units in this range are blocks of two to four flats which were sold on a tenant purchase basis as part of the Pumwani Redevelopment Scheme.

2/ Differs from Table 4 due to the inclusion of a scheme completed during 1974.

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APPRAISAL OF A SITE AND SERVICE PROJECT

Housing Systems in Nairobi, 1970

| Housing Type | Sector | Description | Estimated Number | Population % | |
|---|---|---|---|---|---|
| Squatter | Popular | Unapproved housing on land which the developers do not have a legal right to occupy | 97,200 | 18% | 37% |
| Companies & Dagoretti | Popular | Unapproved housing on land which the developers do have a legal right to occupy. | 102,600 | 19% | |
| Old Tenements | Private Formal | Primarily housing which was originally built for Asian extended families but is now occupied mainly by Africans. | 54,000 | 10% | 33% |
| Employer Provided Housing | Private Formal | Includes servants' housing as well as developments by large-scale employers. | 37,800 | 7% | |
| Private Medium & High Cost | Private Formal | Approved housing which serves the middle and upper income groups. | 86,400 | 16% | |
| Sites & Services | Public | Serviced plots | 16,200 | 3% | 30% |
| Rental & Tenant Purchase Estates | Public | Public housing for rent and purchase | 145,800 | 27% | |

Source: Based on R. Racki, J. Racki and P. Patel: Methodology and Analysis of the Low-Income Housing System, 1972.

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APPRAISAL OF A SITE AND SERVICE PROJECT

## The Construction Industry in Kenya

1. In 1973 building and construction accounted for 52% of total capital formation in Kenya. However, the total value of building completions in 1973 was lower than in 1972, in spite of the fact that the Kenyatta Conference Centre, which was a major building project completed in 1973, is included in the figure. Tables 1, 2, and 3 illustrate this trend. The trend has been the same all over the country and the reason is that the completion of many building projects was held back by a shortage of essential imported building items such as steel, roofing material and sanitary fixtures. There were also shortages in some locations of cement, which is a locally produced material, due to internal marketing and transport difficulties, and the exportation of large quantities of this commodity.

2. The three elements of the construction industry: labor, materials and finance will be viewed separately in analyzing its potential for coping with the proposed site and services project.

3. About 5% of total employment is to be found in the Building and Construction sector. This is a fairly consistent figure for the whole country over the years, except for Nairobi where the percentage has been 10-11% in recent years. Average earnings for construction workers have been fairly constant over the years 1970 to 1972, and 25% higher than the average for all employees. The industry reports that it has had no trouble attracting an adequate supply of semi- and unskilled labor, though there is and has been a shortage of supervisory and skilled staff since the large exodus of Asians. Training of local persons to fill the vacant posts of this type is going on at various levels from Village Polytechnics to the University.

4. There are a good number of contracting firms of all sizes. The Ministry of Works keeps an up-to-date list of contractors, and the National Construction Company which is a training institution sponsored by the Ministry of Works, promotes local contractors including provision of technical assistance. Kenya qualifies for the Bank's local contractor preference and efforts will be made to involve them in the site and service project. For the actual construction of houses it is very likely that, in addition to self-help construction, allottees will hire local contractors or "fundis" (craftsmen) who usually operate alone or with one or two helpers. They are skilled artisans and have long experience in both wood and stone work.

5. Building materials have only recently become a constraint to construction activity in Kenya. This is considered a temporary problem which is rooted in part in the policy of phasing out the non-citizen importers

and wholesalers. As Kenyans now entering the industry become more familiar with marketing and transport methods, these problems will gradually disappear. The flow of contracts will increase with building activity, resulting in local contractors maintaining a better stock of construction materials.

6. Cement is locally produced at two factories, one of which is at Athi River 20 Km to the southeast of Dandora. Production of both cement factories has expanded over the years as follows:

| | | |
|---|---|---|
| 1965 to 1966 | + | 23% |
| 1966 to 1967 | + | 5% |
| 1967 to 1968 | + | 10% |
| 1968 to 1969 | + | 18% |
| 1969 to 1970 | + | 23% |
| 1970 to 1971 | + | 0.2% |
| 1971 to 1972 | + | 1.0% |

In keeping with the industry as a whole. Cement production has slowed in recent years but the industry has the capacity and raw materials to step up production when the situation warrants.

7. Timber is plentiful in Kenya, but has not caught on as a building materials until very recently when the housing companies in the informal sector turned almost exclusively to timber products. Attempts have been made to demonstrate how suitable timber is to higher-cost housing, but there is a traditional aversion to it which is based partly on the difficulties with open fires for cooking indoors and the danger of termite attacks. Although there has been a capacity problem with sawmills, explained in part by the emigration of Asians, production of both soft and hard woods has increased since 1968 and now stands at 288,000 $m^3$. An export market for Kenya timber is now developing which should further stimulate the industry's expansion.

8. There is no shortage of building stone, ballast and sand in Kenya. Many quarries operate around Nairobi, which is known for a good quality building stone extensively used also by small contractors for low-cost housing, for instance, in Kariobangi, an earlier site and service scheme. One quarry is operating on the project site.

9. Costs of building materials have been affected by inflation and thus the cost of construction has gone up as well. Table 4 shows the changes for various kinds of labor and materials from 1966 to 1973. Steel rods (12 mm) have increased by 154% since 1968. The other items range from 20% to 39% with two exceptions: skilled labor wages have gone up by 52% and ballast has fallen 5% since 1968. The cost index for the building industry is listed in Table 5 for Nairobi and the surrounding district.

10. The willingness and ability of financial institutions to support the building and construction industry can make a marked difference to their

performance. This is the case with all long-term production processes including those requiring heavy machinery and substantial stock. The record of Commercial Banks in Kenya for lending to "Building and Construction" has been one of steady rise since 1970 where it stood at K£ 3.4 million to K£ 8.5 million in January of 1974. It is expected that this figure will remain about the same during the year due to the stagnation in the building activity mentioned earlier. The Industrial and Commercial Development Corporation extends loans for machinery, tools, equipment and plant to medium and certain small-scale contractors. A large proportion of work is done, however, by informal contractors falling outside the scope of these programs.

Table 1*

THE VALUE OF ALL PRIVATE BUILDING WORK COMPLETED IN MAIN TOWNS 1967-1973. (£ 000).

| | Nairobi | Mombasa | Nakuru | Kisumu | Kitale | Eldoret | Thika | Others | Total |
|---|---|---|---|---|---|---|---|---|---|
| 1967 | 3.28 | 0.59 | 0.06 | 0.02 | 0.03 | 0.03 | 0.14 | - | 4.15 |
| 1968 | 3.75 | 1.30 | 0.03 | 0.16 | 0.33 | - | 0.11 | - | 5.68 |
| 1969 | 6.05 | 1.01 | 0.12 | 0.08 | - | - | 0.03 | - | 7.29 |
| 1970 | 8.40 | 1.24 | 0.16 | 0.06 | 0.04 | - | 0.01 | - | 9.91 |
| 1971 | 11.29 | 1.22 | 0.08 | 0.14 | 0.05 | 0.02 | 0.01 | - | 12.81 |
| 1972 | 9.59 | 2.72 | 0.16 | 0.18 | - | - | 0.06 | 0.06 | 12.77 |
| 1973* | 3.94 | 1.68 | 0.12 | 0.02 | - | 0.03 | - | 0.02 | 5.81 |

* Source: Ministry of Housing.

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APPRAISAL OF A SITE AND SERVICE PROJECT

National Housing Corporation: Value of Houses Completed 1970-73

(£'000)

| Province | 1970 | 1971 | 1972 | 1973 |
|---|---|---|---|---|
| Central | 337 | -- | 6 | 37 |
| Coast | 179 | 198 | 1,119 | 486 |
| Eastern | 60 | -- | 16 | 44 |
| Nairobi | 1,617 | 1,526 | 3,042 | 899 |
| North Eastern | -- | 14 | 29 | 13 |
| Nyanza | 30 | 17 | 44 | 77 |
| Rift Valley | 147 | 117 | 169 | 89 |
| Western | 72 | 30 | -- | 500 |
| | 2,442 | 1,902 | 4,425 | 2,145 |

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APPRAISAL OF A SITE AND SERVICE PROJECT

N.H.C.: Projects by Province, 1970-73

| | Units Completed | | | | Site and Service Plots Completed | | | |
|---|---|---|---|---|---|---|---|---|
| | 1970 | 1971 | 1972 | 1973 | 1970 | 1971 | 1972 | 1973 |
| Central | 220 | -- | 6 | 34 | 161 | -- | 1,078 | -- |
| Coast | 174 | 208 | 589 | 257 | -- | 100 | 150 | -- |
| Eastern | 50 | -- | 16 | 34 | -- | -- | -- | -- |
| Nairobi | 1,341 | 1,290 | 1,505 | 302 | -- | 1,260 | 741 | -- |
| North Eastern | -- | 8 | 26 | 6 | -- | -- | -- | -- |
| Nyanza | 5 | 20 | 42 | 70 | -- | 105 | 35 | -- |
| Western | 85 | 34 | -- | 238 | -- | -- | -- | -- |
| Rift Valley | 192 | 177 | 313 | 153 | 8 | -- | 96 | 96 |
| TOTAL | 1,880 | 1,737 | 2,497 | 1,092 | 169 | 1,465 | 2,100 | 96 |

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APPRAISAL OF A SITE AND SERVICE PROJECT

Cost of Building Materials and Labor, 1966, 1970-73

| | 1966 | 1970 | 1971 | 1972 | 1973 |
|---|---|---|---|---|---|
| Ballast | 53.6 | 94.0 | 104.0 | 95.0 | 95.0 |
| Stone (230 x 230 mm) | 63.0 | 74.0 | 85.0 | 85.1 | 139.0 |
| Sand | 63.9 | 111.0 | 116.0 | 127.3 | 139.0 |
| Cement | 93.8 | 100.0 | 100.0 | 100.0 | 120.0 |
| Mild Steel Rod (12 mm) | -- | 101.5 | 134.0 | 95.3 | 254.0 |
| Timber | 74.6 | 107.1 | 114.0 | 114.1 | 114.0 |
| Skilled Labor | 69.4 | 111.1 | 111.0 | 111.2 | 152.0 |
| Semi-skilled Labor | 93.1 | 128.0 | 111.0 | 111.3 | 128.0 |
| Unskilled Labor | 83.0 | 110.4 | 111.0 | 111.0 | 128.0 |

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APPRAISAL OF A SITE AND SERVICE PROJECT

Cost Index for Building Industry for Nairobi and District

(Base Year 1970)

| | |
|---|---|
| January 1970 | 100 |
| January 1971 | 105 |
| January 1972 | 110 |
| January 1973 | 120 |
| January 1974 | 135 |
| January 1975 | 155* |

* Estimate.

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APPRAISAL OF A SITE AND SERVICE PROJECT

## Physical Planning

### A. Site Characteristics

1. The Dandora site is located approximately 10 km east of the city center (see Map 11069). The site is strongly defined by topography and man-made features: Komo Rock Road to the south, Nairobi-Thika railroad to the east, and Nairobi River Valley to the west. There are two power lines running north-south on the site which restrict the use of the land under them. There are also several quarries, some of which are abandoned. The shape of the site is enlongated, with steep slopes on the boundaries in the west and north, and more level land in the center. Except for some areas of "black cotton" soil along the ridge in the center, most of the site has murram soil with rock at varying depths. These characteristics dictated the land use plan with a central spine. The gross area of the land to be used for the project is approximately 218 ha. However, the proposed project with 6,000 residential lots and related circulation and community facilities will utilize a total of about 185 ha; the remainder is unusable due to quarries, excessive slope, etc. (see Table 1).

2. Land Ownership: The NCC owns all the land on the site except about 50 ha which have been purchased by the Government from a private owner recently. NCC will pay a charge of 3% of unimproved value for 10 years and 5% thereafter for assignable land. No charge will be assessed for public space.

3. Transport and Employment Linkages: The most direct access to the site is from the Komo Rock Road in the south. A link road to adjacent Kariobangi is also feasible but not proposed initially. The area is at present well served by public transportation with frequent bus service on Komo Rock Road and outer Ring Road to the city center and major industrial areas. Plans for expanding the bus service including routes to serve the proposed project are under consideration. There is also an extensive pirate taxi service or "matatus" servicing Kariobangi.

4. A number of employment sources exist within walking distance of the proposed project site including the Dandora and Ruaraka industrial areas which are to be given preferred treatment by NCC and Government for a new industrial location for Nairobi. With improved transport linkages planned, access to city employment sources will also be improved.

5. Off-site Infrastructure: The site is well located in terms of feasibility for connections to existing/planned trunk infrastructure networks for roads, water supply, sewerage and electricity; main access roads will be from Komo Rock Road which will be extended and upgraded. The trunk water mains necessary to serve the project are scheduled to be completed about mid-1976 under Mid-Chania Phase II scheme. This schedule is in accord with the proposed program for occupation of the lots. The first phase area with 1,000 lots will be served by trunk sewers and temporary oxidation ponds to be constructed in an abandoned quarry within the site. The subsequent phase (5,000 lots) will be served by trunk sewers and oxidation ponds planned further down the Nairobi River. Power will be available from existing lines in the area.

## B. Site Plan

6. The criteria used in planning the Dandora sites and services area can be broadly categorized into socio-economic and engineering criteria. The socio-economic criteria include:

(a) adequate land use planning to ensure maximum locational convenience of housing areas, community facilities areas and circulation areas in terms of access, safety and social interaction and to minimize costs;

(b) adequate provision of community facilities, i.e. schools, clinics, community centers, markets, day care centers etc.

(c) grouping of these facilities in a way to form an attractive and viable nucleus for community activities and to permit multiple uses of building and play areas;

(d) provision of a safe and convenient system of pedestrian circulation linking lots to bus lines, play areas and community facilities;

(e) provision of vehicular circulation within the area which allows access to residential lots, commercial and public areas and provides easy flow of traffic while protecting the neighborhoods from through traffic;

(f) provision of limited car parking areas and garbage pick-up facilities; and

(g) designing lot layouts to reflect local social preferences and life styles, and to minimize disturbances such as traffic noises, industrial activities and natural nuisances.

The engineering criteria includes:

(a) efficient physical planning to comply with desirable ranges of population density and land use percentages for circulation, public areas, private areas and lot coverage - all features of a sound physical layout which is the primary determinant of subsequent commitment in terms of cost of land, and infrastructure networks, administration and maintenance;

(b) adequate provision of basic services, i.e. roads, footpaths, storm water drainage, water supply, fire hydrants, sewage disposal, power supply and security lighting;

(c) flexibility in the design of the physical layout and basic services to permit and provide for future extensions and improvements as household needs and incomes change.

7. In addition to the above criteria the project site plan conforms with the site characteristics. The physcial layout is simple and geometric for economic construction and servicing, and is a modified version of the "gridiron" layout. The land use profile for the project is shown in Table 1. About 50-55% of the usable land is devoted to residential lots, 20-25% to circulation and the remainder to community facilities and open spaces. This distribution of land utilization areas complies with accepted and desirable ranges of land use for residential development. 1/

8. The gross densities 2/ in the project are fairly high--32 lots per hectare on the average yielding gross population densities of between 160-300 persons per hectare assuming 5 - 10 persons per lot. Densities in Nairobi's substandard settlements are considerably higher, approaching 1,800 persons per hectare 3/ because of overcrowded conditions in single room tenements and a lack of community facilities and open space.

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1/ Based on standards developed by several international agencies, academic institutions and public planning agencies, these ranges are: 20-30% for circulation areas, 50-60% for private areas, and 15-30% for other public areas.

2/ Defined in this instance as number of lots divided by total usable area. Desirable/effective gross population density range in such projects is 250-500 persons per ha.

3/ Survey of Mathare Valley in 1971 by the Housing Research and Development Unit of University of Nairobi.

## C. Principal Features of Physical Layout

9. Circulation: The circulation layout provides a network of vehicular roads, pedestrian paths and parking areas which form the primary ordering framework. There is a main through street running longitudinally along the center with local transverse streets. The through street is adequately intercepted to protect the neighborhood from fast through-traffic. The pedestrian circulation links residential areas to commercial and public areas and to the public transport system. Adequate pedestrian crossings will be provided on the through streets.

10. Residential Lots: There are 6,000 lots in the lot layout (see Fig. 1). About 300 lots will be 7.35 m wide and the rest will be 6.30 m wide. The length varies between 15.75 m, 18.90 m and 22.06 m yieldings lot areas of 99.2, 119.1, 138.9 and 161.1 $m^2$. These dimensions are derived from a basic room size of 3.15 m x 3.15 m, which in turn is based on bed sizes. The lot sizes, although small, 1/ are appropriate for Nairobi in terms of cost levels and functional requirements. The 6.3 m wide plots will be distributed as follows: 30% will be 99.2 $m^2$, 35% will be 119.2 $m^2$, 30% will be 138.9 $m^2$, while the 7.35 m wide plots will be 162.1 $m^2$. Thus, while keeping lot widths as narrow as possible, different lot sizes will be offered. The lots are arranged in lateral rows with the wet cores and kitchen units back-to-back. The wet cores are serviced from distribution lines from one side. This solution for lot and services configuration was adopted on economic as well as technical grounds.

11. Spine of Community Facilities: All the community facilities for the project are grouped in the spine running along the site between the two through streets. This feature of the layout takes advantage of the interrelationships of the facilities and permits multiple use of the buildings and surroundings areas. It also reduces construction and services costs.

---

1/ Compared to 324 $m^2$ and 210 $m^2$ in Zambia, 375 $m^2$ in Botswana, 260 $m^2$ in Tanzania, and 150 $m^2$ in Senegal.

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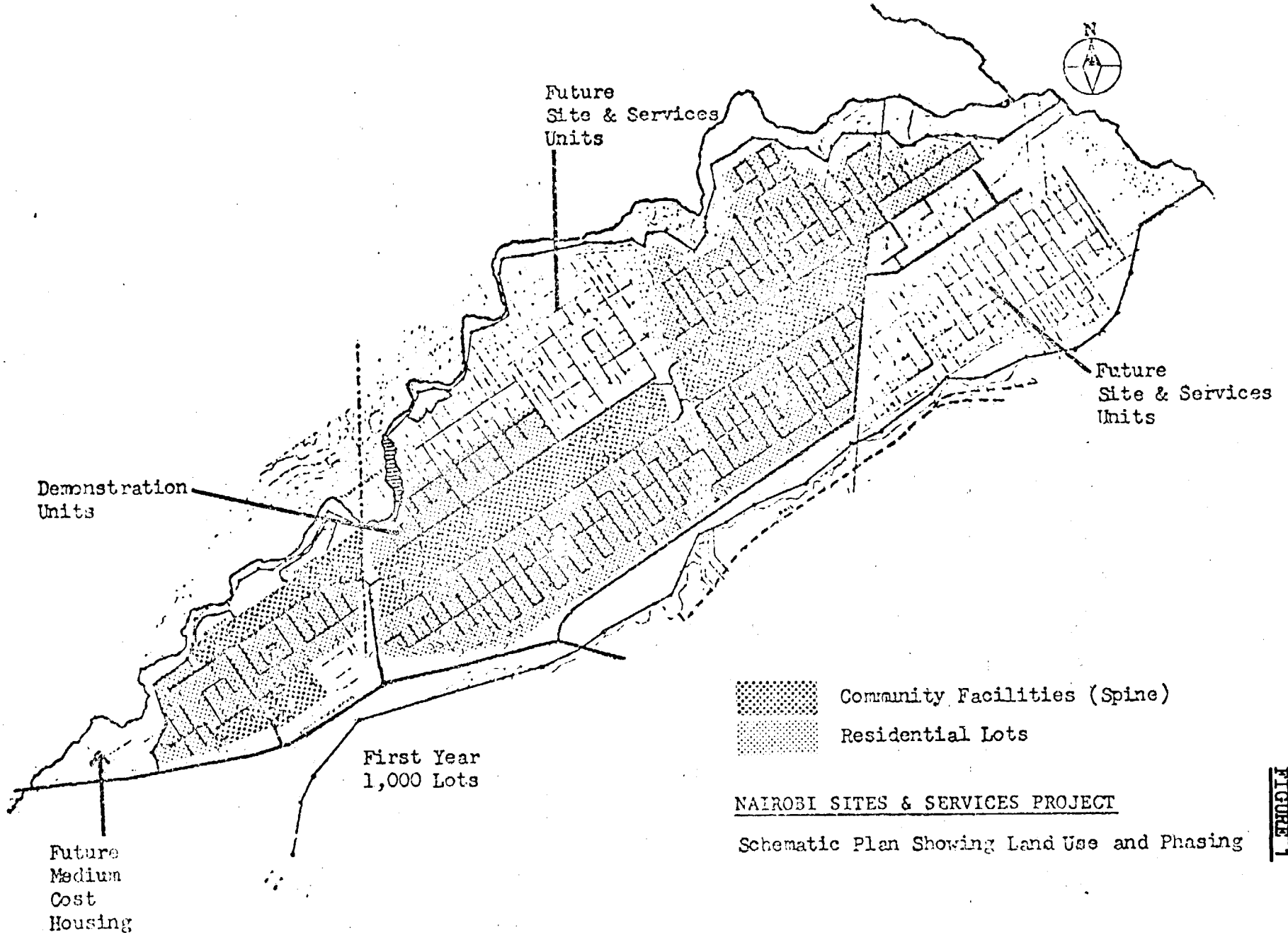
APPRAISAL OF A SITE AND SERVICE PROJECT

Land Use Profile

| | | Phase I 1,000 Lots (ha) | Total 6,000 Lots (ha) | Average (%) |
|---|---|---|---|---|
| 1. | Gross Area | 46.5 | 218.2 | - |
| 2. | Unusable Area (Quarries, excessive slope, etc.) | 13.8 | 32.7 | - |
| 3. | Area available for development | 32.7 | 185.5 | 100 |
| 4. | Residential | 15.0 | 89.8 | 48 /1 |
| 5. | Circulation | 8.2 | 44.5 | 24 |
| 6. | Community Facilities | 9.5 | 51.2 | 28 |

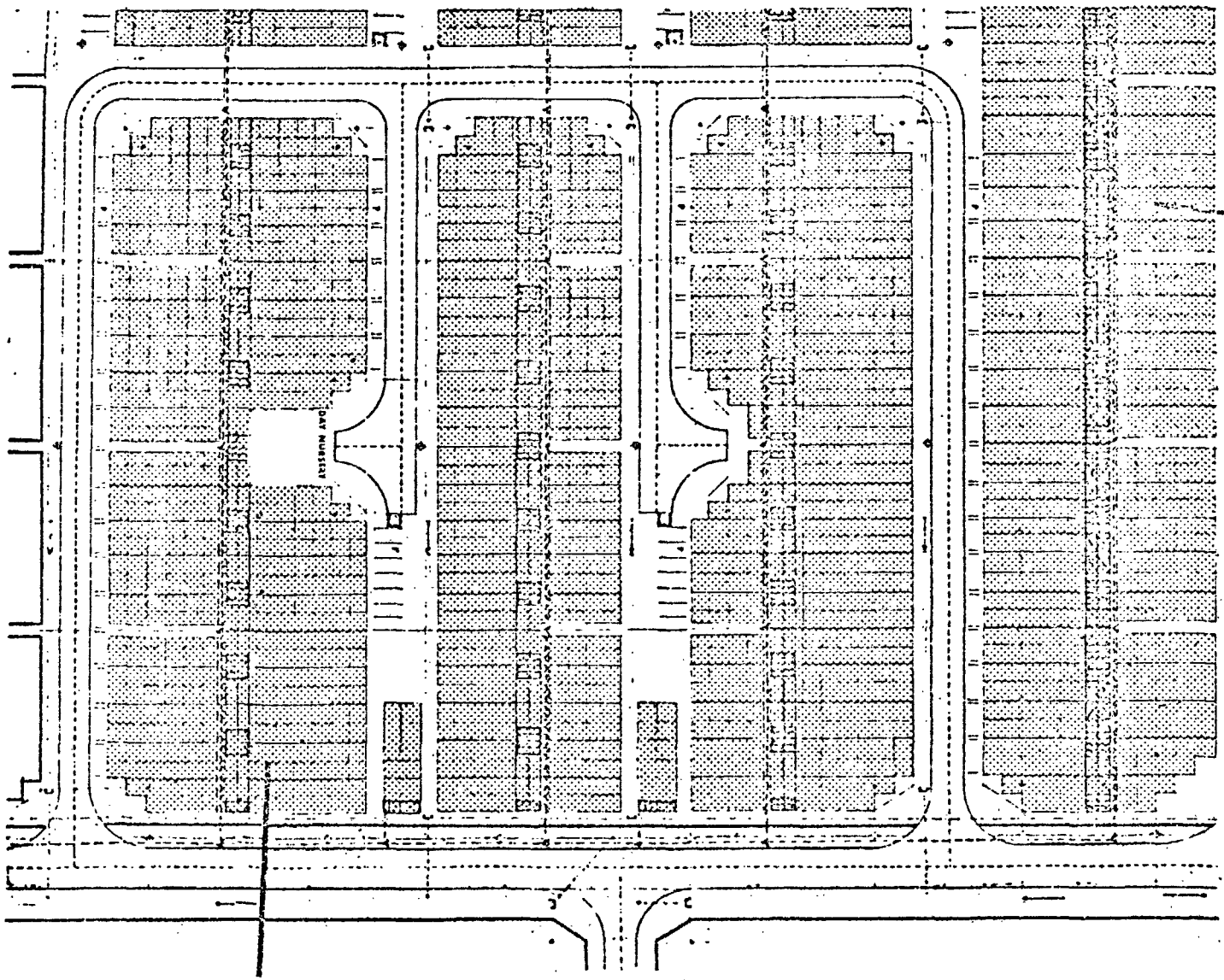
/1 Effective percentage of residential land will be between 50-60% because of the inclusion of additional land within the spine for expansion of community facilities.




NAIROBI SITES & SERVICES PROJECT

Schematic Plan Showing Land Use and Phasing

ANNEX 4
Page 7
FIGURE 1

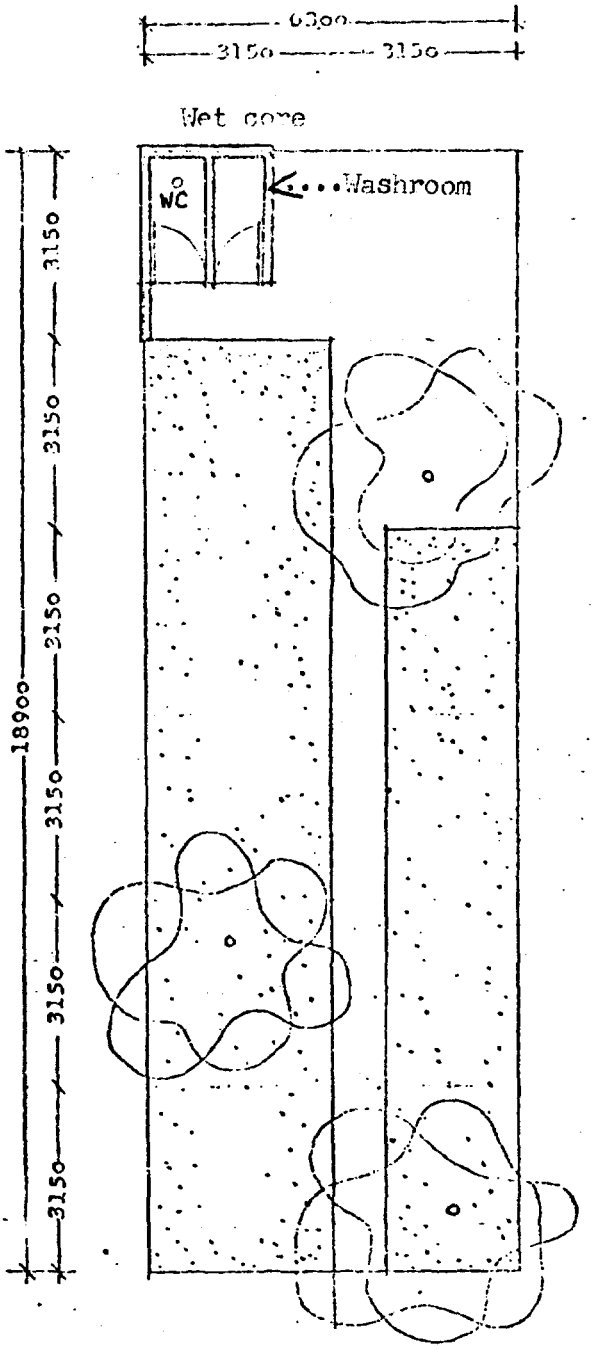



NAIROBI SITES & SERVICES PROJECT

Schematic Plan showing Lot Layout in a Typical Block

Scale: Approx 1: 1,000

FIGURE 3

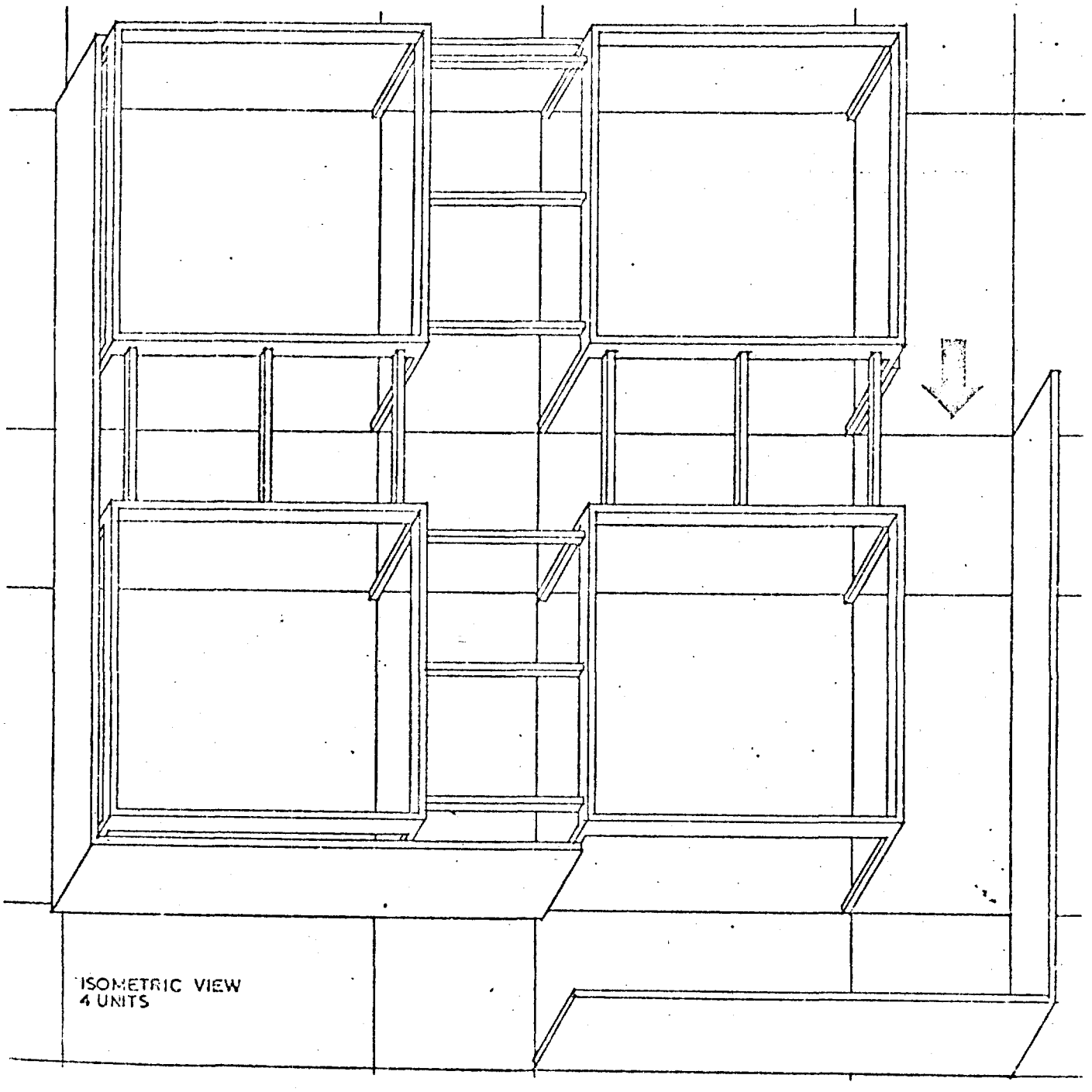



Plot Area: 120 $m^2$

Covered Area: 14.5 $m^2$

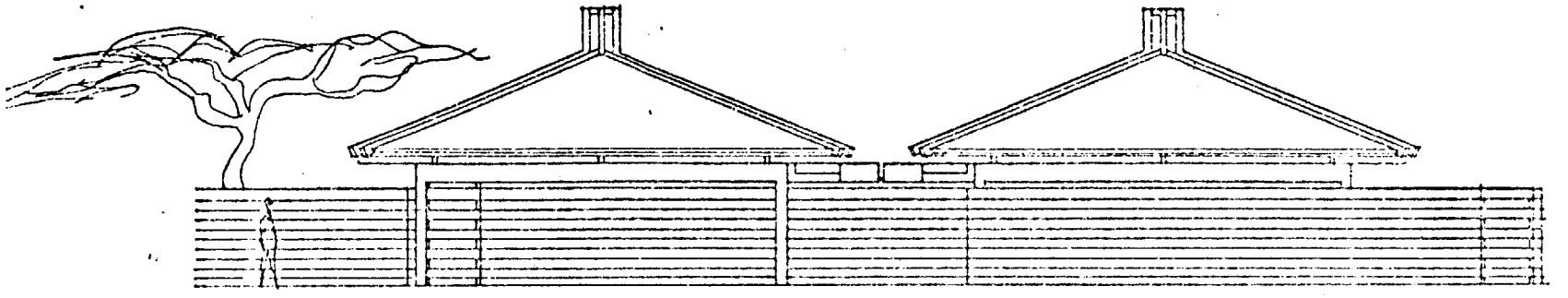
TYPICAL PLOT LAYOUT (Option A)

Built wet core

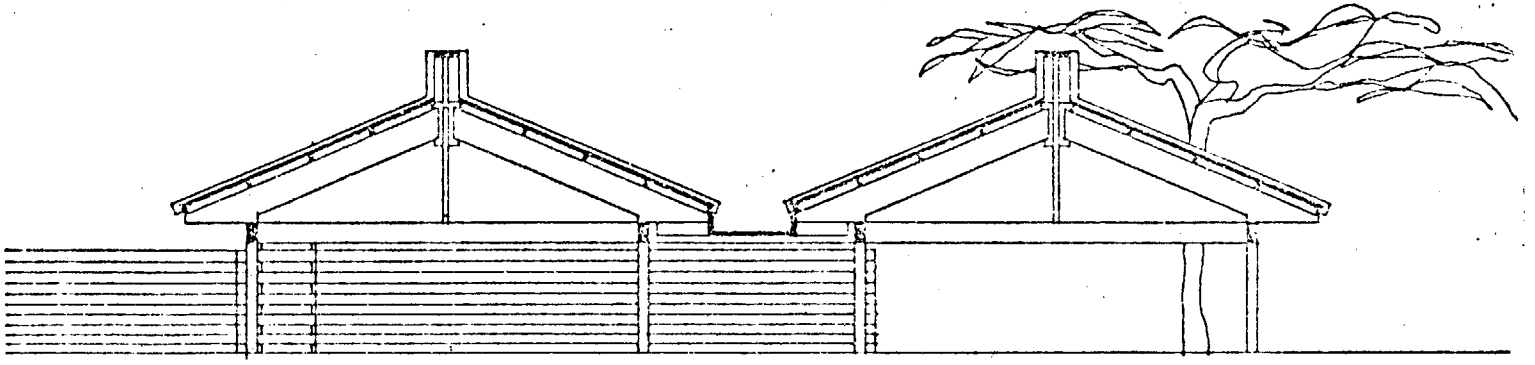



NAIROBI SITES & SERVICES PROJECT

Community Facilities:
Proposed Modular
Building System



ELEVATION



SECTION

NAIROBI SITES & SERVICES PROJECT

Community Facilities:
Proposed Modular
Building System

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APPRAISAL OF A SITE AND SERVICE PROJECT

Design Standards and Cost Estimates

## A. Infrastructure Standards

1. The following standards were adopted after a detailed analysis of the minimum requirements of the site and service project as well as prevailing standards in Nairobi and NCC's grade II Bye-laws which allow construction with mud and wattle.

2. Roads and Surface Water Drainage: The site will have a circulation network providing a primary ordering framework around which the lot layout plan is developed. The site is linked to the city network from Komo Rock Road. Within the site, there is a main through street running along the ridge which also forms the spine containing the community facilities. This main street is linked to a network of secondary roads and footpaths running transversely within the residential zones on either side of the spine.

3. Standards and specification for the various modes of circulation are described below: -

(i) Main Roads will serve as collector roads carrying bus traffic and will be constructed to bus route standards with an overall reservation of about 20 meters. The carriageway will be 7 m wide and will have 3.00 m wide footpaths on both sides with a surface water drainage ditch on each side of the footpaths. The carriageway construction comprises a 12 mm tarmacadam wearing course on a 38 mm tarmacadam base course over a 150 mm hardcore bed blinded with stone dust on 150 mm murram bed on graded and compacted formation. On either side of the carriageway there will be concrete kerbs (250 x 125 mm on one side; 125 x 100 mm on the other). The footpath construction comprises 150 mm murram paving on compacted formation. The surface water drainage ditch construction comprises 450 x 225 m concrete invert block channel with 50 mm concrete slabs at 45 degrees on both sides. The unit cost has been estimated at Ksh 930 per linear meter.

(ii) Secondary Roads will provide vehicular and pedestrian accesses to the residential lots. These roads will have an overall reservation of about 12 meters with a 6.00 m wide carriageway

and 2.30 m wide footpaths on both sides with a surface water drainage ditch on each side of the footpaths. The carriageway construction comprises 225 mm murram paving on graded and compacted formation. The footpath construction comprises 100 mm paving and compacted formation and the surface water drainage ditch is the same as described for main roads. Unit costs have been estimated at KSh 274 per linear meter.

(iii) Parking Areas will be provided along the secondary roads at convenient locations and would consist of 150 mm murram paving on graded and compacted formation. Connecting footpaths and surface water drainage would be provided. Unit costs of KSh 12-20 per sq m have been used.

4. Water Supply: Individual water supply connections will be provided to each lot to serve a water closet, a shower, an outside tap and with provision for installing a water tap and sink in the kitchen at a later date. Water service on each lot will be metered and served by 1/2 inch diameter pipes. The distribution system is designed to cater to fire hydrant requirements and conforms to NCC's standards for consumption levels and regulations.

5. Sewerage: All lots will have individual wet core units with waterborne sewerage facilities. The sewerage system is designed to conform to NCC's water and sewerage department specifications. Concrete pipes of sizes 225 mm diameter for the mains and 150 mm diameter for laterals will be used. Manholes will consist of masonry walls, concrete bases and cast iron covers.

6. Electricity: A system of street lighting and security lighting at major communal areas will be installed. The center-to-center spacing for street lighting will vary within a maximum spacing of about 45 m. Timber poles with overhead wiring will be used. Individual metered electric connections will be available from the East Africa Power and Lighting Company, on application by a stated number of households. A connection charge would be levied.

7. Refuse Collection: Approximately 120 concrete hardstandings will be provided for the whole area. NCC will provide the necessary bins and collection services and charge plot holders through property rates.

8. Site Preparation: Site preparation involves topographic survey including lot demarcation and earthworks. Topographic costs are relatively small as extensive topographic maps on various scales are already available. A detailed topographic survey of scale 1:500 is currently under way with the assistance of Survey of Kenya and will be completed for the whole site by the end of March 1975. Lot demarcation involves beaconing out each corner of lot and stamping of title by the Commissioner of Lands. Earthworks involves clearing and grading, including sisal clearance.

## B. Core Unit Standards

9. Each lot will be provided with basic lot services consisting of water connections to w.c., shower and gulley basin, sewerage and waste water drains in a contractor-built superstructure ('wet core'). In order to accommodate different income levels within the low-income sector, three options of wet core and shelter units are to be provided:

Option A (65%) 3,900 lots, including 30 reserved for demonstration units, in three different sizes, 100, 120 and 140 $m^2$. Each will have the basic lot services in wet cores and participants will be offered a construction materials loan (K£ 240) for developing their shelter. Owners are expected to develop the shelter through self-help or hired labor. Total lot development costs inclusive of the materials loan and physical contingencies are estimated at between K£ 550 - K£ 595 per lot depending on the lot size chosen. About 30 of the 3,900 lots will be developed with different materials and room layouts by the Project Department for demonstration purposes at a per unit cost of about K£ 732.

Option B (30%) 1,800 lots in three different sizes, 100, 120 and 140 $m^2$. In addition to the wet cores outlined in Option A anove, each will have one contractor-built room. Lot owners will be offered a construction materials loan (K£ 120) for further development of the shelter to suit personal requirements using either self-help or sub-contracting. Total development costs including materials loans range between K£ 610 - K£ 650;

Option C (5%) 330 lots Units will have a contractor-built dwelling consisting of two built rooms. No materials loans will be offered to lot owners. The development cost of Option C lots is approximately K£ 825.

Servicing costs for the various lot options are detailed in Table 2 of Annex 8.

## C. Overall Project Costs

10. Cost estimates for site preparation, on-site servicing and lot devleopment are based on detailed engineering for about 700 lots and preliminary engineering for the remainder. Estimates for trunk infrastructure are based on preliminary engineering. Total project costs are estimated at K£ 10.5 (US$29.5) million at January 1975 prices. Physical contingencies of 15% on plot preparation and infrastructure, and 5% on community facilities and core units are included. Price escalation has been calculated at 15% in 1975, 12% for the period 1976 through 1979. Foreign exchange costs are estimated at about 26%.

KENYA

APPRAISAL OF A SITE AND SERVICE PROJECT

Community Facilities

| | Total No. in Project | Description of Facility and Functional Spaces | Total Areas Enclosed | Total Areas Covered | Total Cost Enclosed @ KSh 500 per m² | Total Cost Covered @ KSh 250 per m² | Total Cost Per Unit KSh | Project Total (K£) |
|---|---|---|---|---|---|---|---|---|
| PRIMARY SCHOOLS<br>Based on 75% employment, one 3-stream school for every 7,500. Project includes only 6 schools which would be required to serve population expected in 1979. | 6 | 1,499m² Primary school:<br>1,043m² 21 Classrooms<br>56.0m² Offices/Stores (4 @ 14m²)<br>100m² Toilets<br>1,199m² TOTAL ENCLOSED AREA<br>300<br>1,499m² TOTAL | 1,199 | 300 | 599,500 | 75,000 | 674,500 (@ Jan '75 K£38,784) | 232,700 |
| HEALTH CENTERS | 2 | | 375 | 106 | 187,500 | 26,500 | 214,000 (@ Jan '75 K£12,305) | |
| 1 without maternity wing | | 60m² Waiting and demonstration room<br>123m² Treatment/exam rooms (11 @ 11m²)<br>15m² Waiting area for urinal tests<br>10m² Observation room<br>38m² Dispensary store<br>24m² Staff room<br>18m² Doctor/sisters room + toilet<br>25m² General office + store<br>12m² Records office<br>30m² Changing rooms + toilets<br>20m² Public toilets<br>375m² TOTAL ENCLOSED AREA<br>106m² Covered waiting area<br>481m² TOTAL | | | | | | |
| 1 with maternity wing | | 481m² Health center as above +<br>18m² Reception area<br>25m² Examination room<br>30m² First stage room<br>40m² Delivery room (2 @ 20m²)<br>30m² Kitchen, sterilizing<br>10m² Toilets, nurses' station<br>25m² Toilets/shower<br>150m² Wards<br>10m² Store<br>338m² TOTAL ENCLOSED AREA<br>35m² Covered areas<br>373m² TOTAL | 375<br><br><br><br>338 | 106<br><br><br><br>35 | 187,500<br><br><br><br>169,000 | 26,500<br><br><br><br>8,750 | 214,000 (@ Jan '75 K£12,305)<br><br><br><br>177,750 (@ Jan '75 K£10,235) | 34,845 |
| MULTIPURPOSE COMMUNITY CENTERS | 2 | 570m² Complex:<br>167m² Large hall<br>18m² Projection room<br>200m² Offices, committee rooms, classrooms<br>100m² Women's training center<br>33m² Stores<br>20m² Sanitary facilities<br>538m² TOTAL ENCLOSED AREA<br>32m² Covered areas, corridors<br>570m² TOTAL | 538 | 32 | 269,000 | 8,000 | 277,000 (@ Jan '75 K£15,928) | |
| With Day-Care Facility | | 178m2 TOTAL ENCLOSED AREA<br>30m2 Covered Verandah and Corridor<br>208m2 TOTAL | 178 | 30 | 89,000 | 7,500 | 96,500 (@ Jan '75 K£5,550) | 42,955 |
| SPORTS COMPLEX | 1 | 50m2 Offices, stores<br>50m2 Toilets<br>50m2 Changing rooms<br>150m2 TOTAL ENCLOSED AREA | 150 | 0 | 75,000 | | 75,000 (@ Jan '75 K£4,310) | 4,310 |
| MARKETS | | 1,920m² Stalls (96 @ 20m²)<br>1,260m² Stalls (84 @ 15m²)<br>2,220m² Stalls (222 @ 10m²)<br>5,400m² COVERED AREAS | -- | 5,400 | -- | 1,350,000 | 1,350,000 (@ Jan '75 K£77,625) | 77,625 |

1/ The costs have been brought up to January 1975 from April 1974 estimates by applying a price increase factor at the annual rate of 20% for the year 1974.

KENYA

APPRAISAL OF A SITE AND SERVICE PROJECT

Breakdown of Wet Core Costs
Option A - Terraced Layout

(In Kenya Shillings)

**January, 1975 Prices**

| ELEMENT | MATERIALS | LABOR | TOTAL |
|---|---|---|---|
| Foundations | 225 | 110 | 335 |
| Walls | 334 | 145 | 479 |
| Floor Slabs | 76 | 43 | 119 |
| Roof | 207 | 15 | 222 |
| Doors | 438 | 42 | 480 |
| Roof Drainage | 56 | 7 | 63 |
| Sewerage | 708 | 164 | 872 |
| Water Supply | 136 | 120 | 256 |
| Fencing | 26 | 26 | 52 |
| Sub-total | 2,206 | 672 | 2,878 |
| **Miscellaneous @ 10%** | | | 288 |
| **Price Escalation April 1974 - January 1975 @ 15%** | | | 475 |
| TOTAL for 4.73m$^2$ wet core | | | 3,641 |
| | | | (K£182) |

KENYA

APPRAISAL OF A SITE AND SERVICE PROJECT

Breakdown of Wet Core + One Room Unit Costs

Option B - Terraced Layout

(In Kenya Shillings)

**January, 1975 Prices**

| ELEMENT | MATERIALS | LABOR | TOTAL |
|---|---|---|---|
| Foundations | 463 | 227 | 690 |
| Walls | 677 | 284 | 961 |
| Floor Slabs | 207 | 118 | 325 |
| Roof | 599 | 42 | 641 |
| Windows | 220 | 24 | 244 |
| Doors | 876 | 84 | 960 |
| Roof Drainage | 126 | 11 | 137 |
| Sewerage | 722 | 179 | 901 |
| Water Supply | 208 | 135 | 343 |
| Fencing | 23 | 23 | 46 |
| Kitchen Fixtures | 140 | 84 | 224 |
| Sub-total | 4,261 | 1,211 | 5,472 |
| **Miscellaneous @ 10%** | | | 547 |
| **Price Escalation April, 1974 - January 1975 @ 15%** | | | 903 |
| TOTAL for 13.7m$^2$ wet core + one room unit | | | 6,922 |
| | | | (K£346) |

KENYA

APPRAISAL OF A SITE AND SERVICE PROJECT

Breakdown of Wet Core + Two Room Unit Costs
Option C - Terraced Layout

(In Kenya Shillings)

**January, 1975 Prices**

| ELEMENT | MATERIALS | LABOR | TOTAL |
|---|---|---|---|
| Foundations | 847 | 409 | 1,256 |
| Walls | 1,232 | 604 | 1,836 |
| Floor Slabs | 406 | 221 | 627 |
| Roofs | 1,251 | 81 | 1,332 |
| Windows | 440 | 48 | 488 |
| Doors | 1,315 | 126 | 1,441 |
| Roof Drainage | 186 | 27 | 213 |
| Sewerage | 722 | 179 | 901 |
| Water Supply | 208 | 135 | 343 |
| Surface Drainage | 151 | 225 | 376 |
| Paving | 10 | 16 | 26 |
| Fencing | 274 | 102 | 376 |
| Kitchen Fixtures | 140 | 84 | 224 |
| Sub-total | 7,182 | 2,257 | 9,439 |
| **Miscellaneous @ 10%** | | | **944** |
| **Price Escalation April 1974 - January 1975 @ 15%** | | | **1,557** |
| TOTAL for 26.63m$^2$ two room unit | | | **11,940** |
| | | | **(KŁ597)** |

KENYA

APPRAISAL OF A SITE AND SERVICE PROJECT

Detailed Project Costs

Foreign/Local

| | Ksh | | | US$ | | |
|---|---|---|---|---|---|---|
| | Local | Foreign | Total | Local | Foreign | Total |
| **1. Site Preparation** | | | | | | |
| Clearing and Grading | 28,463 | 9,487 | 37,950 | 79,696 | 26,564 | 106,260 |
| Topography and Soil Surveys | 10,350 | - | 10,350 | 28,980 | - | 28,980 |
| Lot Demarcation | 69,000 | - | 69,000 | 193,200 | - | 193,200 |
| Fencing of Power Lines | 1,150 | - | 1,150 | 3,220 | - | 3,220 |
| Sub-total | 108,963 | 9,487 | 118,450 | 305,096 | 26,564 | 331,660 |
| **2. On-Site Infrastructure** | | | | | | |
| Roads and Surface Drainage | 496,398 | 165,427 | 661,825 | 1,389,914 | 463,196 | 1,853,110 |
| Water Reticulation | 112,988 | 37,662 | 150,650 | 316,366 | 105,454 | 421,820 |
| Sewerage Reticulation | 118,767 | 39,588 | 158,355 | 332,548 | 110,846 | 443,394 |
| Street Lighting | 49,335 | 16,445 | 65,780 | 138,138 | 46,046 | 184,184 |
| Landscaping | 8,625 | 2,875 | 11,500 | 24,150 | 8,050 | 32,200 |
| Refuse Collection | 17,422 | 5,808 | 23,230 | 48,782 | 16,262 | 65,044 |
| Sub-total | 803,535 | 267,805 | 1,071,340 | 2,249,898 | 749,854 | 2,999,752 |
| **3. Community Facilities** | | | | | | |
| Primary Schools | 174,525 | 58,175 | 232,700 | 488,670 | 162,890 | 651,560 |
| Health Centers | 26,123 | 8,722 | 34,845 | 73,144 | 24,422 | 97,566 |
| Com. Centers and Day-Care Facil. | 32,216 | 10,738 | 42,955 | 90,205 | 30,068 | 120,274 |
| Markets | 58,219 | 19,406 | 77,625 | 163,013 | 54,337 | 217,350 |
| Sports Complex | 3,277 | 1,033 | 4,310 | 9,176 | 2,892 | 12,068 |
| Sub-total | 294,360 | 98,075 | 392,435 | 824,208 | 274,610 | 1,098,818 |
| **4. Core Units** | | | | | | |
| Wet Cores | 528,255 | 176,085 | 704,340 | 1,479,114 | 493,038 | 1,972,152 |
| One-Room Units | 467,100 | 155,700 | 622,800 | 1,307,880 | 435,960 | 1,743,840 |
| Two-Room Units | 134,325 | 44,775 | 179,100 | 376,110 | 125,370 | 501,480 |
| Demonstration Units | 16,470 | 5,490 | 21,960 | 46,116 | 15,372 | 61,488 |
| Sub-total | 1,146,150 | 382,050 | 1,528,200 | 3,209,220 | 1,069,740 | 4,278,960 |
| **5. Materials Loan Fund** | | | | | | |
| Option A Loans | 928,800 | - | 928,800 | 2,600,640 | - | 2,600,640 |
| Option B Loans | 216,000 | - | 216,000 | 604,800 | - | 604,800 |
| Sub-total | 1,144,800 | - | 1,144,800 | 3,205,440 | - | 3,205,440 |
| **6. Trunk Infrastructure** | | | | | | |
| Access Roads | 35,075 | 35,075 | 70,150 | 98,210 | 98,210 | 196,420 |
| Temporary Stabilization Pond | 8,000 | 4,000 | 12,000 | 22,400 | 11,200 | 33,600 |
| Service Trunk Sewers | 112,000 | 55,000 | 167,000 | 314,000 | 154,000 | 468,000 |
| Main Trunk to Site D | 882,000 | 434,000 | 1,316,000 | 2,470,000 | 1,215,000 | 3,685,000 |
| Sewage Treatment Works | 353,000 | 174,000 | 527,000 | 988,000 | 487,000 | 1,475,000 |
| Land | 71,000 | - | 71,000 | 199,000 | - | 199,000 |
| Sub-total | 1,461,075 | 702,075 | 2,163,150 | 4,091,610 | 1,965,410 | 6,056,820 |
| **7. Technical Assistance** | | | | | | |
| Project Unit | 243,600 | 104,400 | 348,000 | 682,080 | 292,320 | 974,400 |
| Design and Engineering | 112,785 | 263,165 | 375,950 | 315,800 | 736,860 | 1,052,660 |
| Monitoring | 18,000 | 18,000 | 36,000 | 50,400 | 50,400 | 100,800 |
| Studies: | | | | | | |
| NCC Housing Operations | 21,500 | 21,500 | 43,000 | 60,200 | 60,200 | 120,400 |
| Project Preparation | 70,000 | 70,000 | 140,000 | 196,000 | 196,000 | 392,000 |
| Sub-total | 465,885 | 477,065 | 942,950 | 1,304,480 | 1,335,780 | 2,640,260 |
| **8. Contingencies** | | | | | | |
| Physical (15% on Items 1, 2 and 6, 5% on Items 3 and 4) | 363,946 | 223,064 | 587,010 | 1,019,049 | 624,579 | 1,643,628 |
| Price Escalation on Items 1-6, and Project Unit | 1,972,150 | 622,780 | 2,594,930 | 5,522,020 | 1,743,780 | 7,265,800 |
| Sub-total | 2,336,096 | 845,844 | 3,181,940 | 6,541,069 | 2,368,359 | 8,909,428 |
| TOTAL | 7,760,864 | 2,782,401 | 10,543,265 | 21,730,821 | 7,790,317 | 29,521,138 |

KENYA

APPRAISAL OF A SITE AND SERVICE PROJECT

Nairobi Sewerage Program

1. The city of Nairobi has an estimated population of slightly more than 700,000 (Nairobi Urban Study Group projection) in 1974 and is expected to grow at an average rate of 5.4% per annum 1/ (compound) to 2,880,000 in year 2000. NCC estimates that about 60% of the total population, or 420,000 people, is served by the Nairobi Sewerage System. The served population is projected to increase to 670,000 ty 1979, 1,080,000 by 1985, and 2,430,000 by year 2000.

2. In response to the Kenyan Government's request for assistance to prepare a plan tc meet the growing sewerage meeds of the city, the United nations Development Program (UNDP) is financing a study which is being executed by the World Health Organization (WHO) and conducted by the consultant SWECO of Sweden. The study, titled "Nairobi Sewerage and Groundwater Survey," is now in its final stages of completion. Figure 1 shows the tentative recommendations for the sewerage plan under this study.

3. The consultant has also prepared a preliminary engineering and feasibility study of the First Stage Program of the plan, which outlines sewerage works required in Nairobi up to year 1979/80. Part of the work in this program will be needed to serve the I.B.R.D. Site and Service Project at Dandora, and this portion of the program (IBRD Map no. 11391) is being considered for a loan as a component of the Site and Service Project. The sewerage work to be included in this project contains major elements which will serve other parts of the city. For this reason appraisal of the sewerage component would require consideration of the entire sewerage program for Nairobi.

## A. Existing Conditions of the Nairobi Sewerage System

4. The city of Nairobi has an area fo 670 square kilometers within its statutory limits. Of this area about 3500 ha. (net, excluding parks and other open areas) are served by a sewerage system. Residents in the unserved areas, which are in most parts scantily populated, use septic tanks, conservancy tanks, cesspools, bucket latrines and pit latrines. A few small communities and some factories have individual treatment facilities, usually in the form of small waste stabilization ponds.

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1/ 6.8% from 1974 to 1980, 5.9% from 1980 to 1985, 5.0% from 1985 to 2000.

5. Except for a small area in the city center (about 125 ha.), the existing sewers in Nairobi are on a separate system. Nevertheless a sizable amount of stormwater finds its way into the system through openair wash areas connected to the system and through faults. The sewer system is mainly a gravity one, and pumping is required only for a few small low-lying areas.

6. Wastewater from the sewerage system is treated in two major treatments works: Kariobangi and Eastleigh Sewage Treatment Works. Both are trickling filter plants, 12 and 40 years old respectively, with designed treatment capacities of 32,000 and 16,000 $m^3$ per day. A third sewage treatment works, the Industrial Area STW consisting of waste stabilization ponds with a capacity to treat 4,500 $m^3$ per day is under construction. An extension of these ponds to twice the present designed capacity is also being planned.

7. The SWECO study (para. 3) shows that existing wastewater treatment facilities in Nairobi are unable to cope with the present hydraulic and biological loads. Large amounts of excess raw sewage are being bypassed directly into the Nairobi River, and this, coupled with other unidentified sources of pollution within the city, is affecting the quality of the water in the river. In a survey conducted by NCC in 1971/72, it was found that the river water quality deteriorated very rapidly as the river passed through the city center, and became anaerobic for a stretch of almost 30 kilometers. Unless remedial measures are taken soon, the situation will worsen with time as the population in Nairobi multiplies with accompanying increases in wastewater flows as a result of planned expansion of the city's water supply system.

8. The Ministry of Water Development (previously the Water Department of the Ministy of Agriculture), which is the national authority on water quality and pollution control, has expressed concern over the quality of the water in Nairobi River at and downstream of Nairobi. The water has a number of possible downstream uses including irrigation, drinking water supply, recreation, and together with the Athi and Tsavo Rivers (to form the Sabaki River) will eventually be a major source of drinking water supply to the Coast Province (Mombasa and other communities along the coast). The Ministry has advised the Nairobi Sewerage and Groundwater Survey team that the water in Nairobi River should be upgraded to have a dissolved oxygen content of not less than 1 mg/1. This standard has been used as the basis for preliminary design of the treatment facilities and is considered by Bank mission members to be reasonable.

## B. The Nairobi Sewerage and Groundwater Survey

9. The Nairobi Sewerage and Groundwater Survey (para. 2) commenced during the last quarter of 1972, and is nearing completion. The object of the study is to prepare a master plan for the development of sewerage facilities in Nairobi, and to investigate groundwater resources which may be used

to augment the city's water supply. The groundwater aspect of the study is not covered in this report. The planning period covers three stages:

| | |
|---|---|
| First stage (in 3 phases) | up to 1979 |
| Second stage | 1979 to 1985 |
| Future stage | 1985 to 2000 |

10. In view of the pressing need to improve and enlarge the sewerage system in Nairobi, WHO instructed SWECO in early 1974 to proceed with a preliminary engineering and feasibility study of works required in the First Stage Program. The resulting proposed program, to be implemented in three phases, consists of trunk and reticulation sewers and additional wastewater treatment facilities. A summary of the work required in this program is found in Tables 1 and 2 which give the estimated costs of January 1974 prices and at escalated prices.

11. To meet the requirements of the Ministry of Water Development, SWECO recommends that secondary treatment of the wastewater to an effluent standard of 20 mg/1 $BOD_5$ (5-day biochemical oxygen demand) and 30 m/1 suspended solids will be adequate for the First and Second stages. After 1985 some form of advanced treatment will be required. Various methods of wastewater treatment have been examined by the consultant, and the most economical solution is found to be that using waste stabilization ponds. This is explained by the fact that large tracts of land at low costs are available within a reasonable distance of the city center.

12. Three sites have been identified by SWECO as being suitable for locating the future waste stabilization ponds (IBRD Map No. 11391):

Site B - 10 km. downstream of Kariobangi or about 17 km. from the city center.

Site C - 3-1/2 km. downstream of Site B or about 20-1/2 km. from the city center.

Site D - 3 km. downstream of Site C or about 23-1/2 km. from the city center.

Sites B and C are small sites and can each accommodate ponds capable of treating 30,000 $m^3$ per day of wastewater (a capacity that will cope with flow increases over 2 to 3 years). Land availability is virtually unlimited at Site D. Two alternative plans for development were suggested:

Alternative 1

Develop Site B, Site C and Site D progressively as and when dictated by wastewater flows. This alternative makes use of the proximity advantage of Sites B and C, and results in lower capital outlay in the early years.

Alternative 2

Develop Site D at once and ignore Sites B and C. This alternative has the advantage of centralized operation control and cheaper pond construction costs due to grouping of the facilities.

Analysis shows little difference in the discounted costs (at 8% and 12%) of the two alternatives, and the decision on the choice of Alternative 2 was based on other more subjective reasons of the Nairobi City Council (NCC).

13. Appraisal of the Site and Service Project in July 1974 disclosed that to assure adequate sewerage for the Dandora area when needed, major elements of Nairobi's First Stage Sewerage Program would have to be included for financing with the project; otherwise, financial constraint of NCC could postpone the sewerage works and thus delay sewerage service to the Dandora development. Consequently, in October 1974, the sewerage program was appraised on the basis of the Sewerage and Groundwater Survey and the resulting preliminary engineering and feasibility work (para. 10).

## C. Justification of the Nairobi Sewerage Program

14. The program is intended to meet the growing sewerage needs of Nairobi. Nairobi is the capital of Kenya and the main center of population, commerce, tourism and industry. The Government attaches high priority to the program.

15. The city has large tracts of virtually uninhabited land which provide scope for development. Industrial growth has been estimated at about 6% per annum. Tourism is expanding rapidly and this is expected to continue. In a study by the Nairobi Urban Study Group (NUSG) which was completed in 1973, Nairobi's population was projected to grow at a much higher rate (para. 1) than the national average of around 3-1/2% per annum, despite the Government's recent policies of promoting family planning, decentralization and rural growth. Real GDP growth for the city is forecast at about 8% per annum.

16. With the commissioning of Phase 1 of the Middle Chania Water Supply Project in March 1974, Nairobi now enjoys an adequate water supply, although work continues on the removal of some distribution constraints. The next phase of the scheme, which will almost double the system capacity, is being studied. Concurrent with increasing water use is the demand for sewerage facilities in the city. The existing wastewater treatment capacity in Nairobi is now exceeded by wastewater flows resulting in the overflow of raw wastewater into its rivers. Many new areas under development as well as some old areas in the city are still unsewered. To alleviate the existing shortage and to meet future needs it will be necessary (a) to extend the

system of sewers in the city for the collection of wastewater in new and old unsewered areas, and (b) to construct additional wastewater treatment capacity to adequately treat the collected wastewater prior to discharge into the receiving waters. The First Stage Sewerage Program will meet these objectives up to year 1979. The Program will provide an incremental treatment capacity of 64,500 $m^3$/day and trunk and reticulation sewers to serve an additional population of about 400,000, and industrial flows with a population equivalent of about 80,000 people.

17. Projected water demands and wastewater flows up to 1985 are shown in Table 3. The projections for water demands are based on NUSG's estimates of population classified into various income groupings, and estimated per capita consumption for each consumer class. Sewerage flows are calculated from water use by consumers who are presently served by sewers or will be served under the Nairobi Sewerage Program. Since the program is rather ambitious (target of 60% of total population served in 1975 and 77% in 1985), it is likely to be over-optimistic. However as the program does not contain very lumpy investments at any one phase, it is possible to curb investment should future sewage flows not be as high as projected.

18. The work in the proposed First Stage Program has been found to be the best solution among the various alternatives considered from the technical, financial and economic points of view. The selected site for the treatment works (para. 12) is advantageously located for the use of sewage effluent for field irrigation, a process which appears at present to be the most economical method of advanced treatment required after 1985.

19. If demand grows as forecast, the economic internal rate of return for the combined First and Second Stages of the program (capacity to be reached in 1985) is estimated at about 15.3%. The analysis assumes a shadow foreign exchange rate of US$1 = K Shs10.00 (against an official exchange rate of US$1 = K Shs7.10), and benefits represented by sewerage revenues at the current price of K Shs0.88/$m^3$ (K Shs4.0/1000 Ig). The percentage cost for labour is expected to be small in sewerage construction work, and most of the labour employed will be skilled. Since skilled labour is in short supply in Kenya, labour costs have not been shadow priced. However, to give some indication of the sensitivity of the IRR to reduction in local costs (such as arising from shadow pricing labour, and the elimination of hidden tax elements in the cost of local goods and services), a test has been made using local costs reduced by a factor of 0.9. A resulting increase in the IRR of about 3/4% is obtained. Using similar assumptions the IRR for the First Stage only (capacity at 1979) is 13.2%, without giving credit for excess capacities in certain trunk sewers at the end of this stage. Cost and benefit streams used in the calculations are shown in Tables 10 and 11. Results of the IRR calculations and sensitivity analyses for changes in shadow foreign exchange rates, and benefits calculated from sewerage charges are shown in Figure 1. Some outstanding features of the analyses are tabulated below:

| | Analysis Assumption | Effect on IRR |
|---|---|---|
| a. | Change in foreign exchange shadow price + (-) 15% | - (+)1% approx. |
| b. | Per 10% increase (decrease) in sewerage charge rate (for calculating benefits) | + (-)1% approx. |

20. Capital cost estimates for the First Stage Program are based on preliminary engineering by SWECO using unit prices experienced with recent NCC sewerage contracts, and from informal quotations provided by contractors and suppliers. These estimates are therefore considered to be reasonable sound. Capital cost of sewerage works in the Second Stage Program has been estimated using an average annual capital expenditure for service trunk and reticulation sewers based on the First Stage Program, and sewage treatment facilities (at current estimated unit prices) sized to meet projected sewage flows. Cost estimates for this stage are therefore less reliable, but as they occur later in the cost stream, their effect on the IRR is correnspondingly less significant. In the event of a cost over-run of 20% on capital works (which is not expected to be exceeded), the IRR will be reduced by about 1.7%. Sewerage operation and maintenance costs are small compared to capital costs and benefits, and the effect of changes in these costs on the IRR is therefore negligible.

21. Benefits used in calculating the IRR are taken to be the revenue from sewerage service provided at the current rate for charges. Although in some cases the service is enforced by law (para. 41), there is evidence that most residents and plot-holders are willing to have the service. The ratio of sewerage use charge to household income averages to about 1.6%, and ranges from about 0.5% in the 20% of households in the highest income bracket to about 2.6% for the 20% in the lowest income bracket. Secondary benefits will also accrue to dwellers along the rivers whose environs have been improved as a result of the program, as well as to others who derive use from the riverwater. These benefits, including but not restricted to improved health conditions, increased recreational facilities, and better farm products, cannot be assessed quantitatively, and have not been included in the calculations.

22. It is possible for actual revenues to fall below projected revenues due to over-estimates in sewage discharges, but as mentioned in para. 17 the program can be slowed down should this happen thus minimizing the undesirable effect of sunk captial costs. Nevertheless it is prudent to allow for the possibility of a continued program as planned in spite of some small (say 5%) short-fall in revenue. Moreover the effect of a reduction in revenue is not completely counteracted by a curtailment of capital expenditure made at a later date. The risks represented by increased costs and reduced revenues are summarized below:

| | Effect on IEE |
|---|---|
| 20% increase in capital cost | - 1.7% |
| Increase in O. & M. cost | negligible |
| 5% reduction in revenue | - 0.5% |
| Total | - 2.2% |

The pessimistic estimates of the IRR based on tangible costs and benefits are therefore 13.1% for the combined First and Second Stages Program, and 11.0% for the First Stage Program only.

D. Sewerage Works required for the Dandora Site and Service Project

23. The site for the Dandora Site and Service Project is located in the Nairobi River watershed, immediately downstream of the Kariobangi Sewage Treatment Works on the opposite bank of the river. The original concept for off-site sewering of this project included a pair of short site service trunk sewers from the site to new waste stabilization ponds sized for the project and located near Nairobi River about 5-1/2 km. downstream of the Kariobangi S.W.T. Later studies disclosed that it would be better to have the site service trunk sewers connected to the proposed main trunk sewer at Nairobi River, which was included in the First Stage Sewerage Program (para. 10). A major reason for this decision was there were land acquisition problems at the proposed site for the stabilization ponds.

24. After several meetings between Bank mission members and NCC it was decided that the Site and Service Project would include, in addition to the site service trunk sewers, the portion of the main trunk sewer from the discharge point of the site service trunk sewers to Site D (para. 12), and a sewage treatment works of 30,000 $m^3$/day capacity at site D. This was confirmed during the negotiations in March 1975.

25. The completion date for the sewerage work is estimated to be in mid-1978. The project will also bear the cost of constructing a temporary waste stabilization pond at an old quarry site owned by NCC to provide sewage treatment for an initial phase of 1000 housing units of the project scheduled for mid-1976.

26. Off-site sewerage works to be included in the Site and Service Project are summarized as follows, together with their estimated costs:

## Off-Site Sewerage Works

| | Cost Estimate | | | | | |
|---|---|---|---|---|---|---|
| | K£ 000's | | | US$ 000's | | |
| | Local | Foreign | Total | Local | Foreign | Total |
| Temporary waste stabilization pond | 8 | 4 | 12 | 22 | 11 | 33 |
| Service trunk sewers from site to main trunk sewer | 112 | 55 | 167 | 314 | 154 | 468 |
| Main trunk sewer to Site D (approx. 14.5 km) | 882 | 434 | 1,316 | 2,470 | 1,215 | 3,685 |
| Sewage treatment works at Site D (30,000 $m^3$/day) | 353 | 174 | 527 | 988 | 487 | 147 |
| Land | 71 | - | 71 | 199 | - | 199 |
| Consulting services | 68 | 157 | 225 | 190 | 440 | 630 |
| Sub-Total | 1,494 | 824 | 2,318 | 4,183 | 2,307 | 6,490 |
| Provision for Physical Contingencies | 202 | 100 | 302 | 566 | 280 | 846 |
| Total cost of work (at Jan. 1975 prices) | 1,696 | 924 | 2,620 | 4,749 | 2,587 | 7,336 |
| Provision for Price Increases | 641 | 342 | 983 | 1,795 | 958 | 2,753 |
| Total Cost of Work (at escalated prices) | 2,337 | 1,266 | 3,603 | 6,544 | 3,545 | 10,089 |

27. Inflation factors used in determining escalated prices are 15% for 1975, and 12% for 1976 and for each year thereafter.

28. A proposed schedule for the off-site sewerage works based on the sewage treatment works at Site D is shown in Figure 2. The sewerage works are planned for completion in time to serve both the initial and final phases of the Site and Service Project scheduled for mid-1976 and mid-1978 respectively. A captial expenditure schedule for the sewerage works is shown in Table 12.

29. The design for the major part of these works will be carried out by a consultant, and work on consultant selection is in hand. Engagement of the consultant will be in accordance with the Bank's guidelines. The urgent works consisting of the construction of the temporary waste stabilization pond and a short length of site service trunk sewer to carry wastewater to this pond, will be designed by staff of NCC's Water and Sewerage Department.

## E. The Nairobi Water and Sewerage Department

30. The Nairobi Water and Sewerage Department (WSD) was established in April 1970 as a precondition for a Bank Loan (714-KE) for the Nairobi Water Supply Project. The department, which is one of seven departments of NCC, is headed by a General Manager and is responsible for all water supply and sewerage activities of the city. He is assisted by two Deputy Managers--one for engineering operations and the other in charge of financial and commercial matters. A separate small unit under the General Manager is in charge of administration of the department.

31. The Deputy Manager (Engineering) controls three sections whose responsibilities are divided on a functional basis. Operations and maintenance of the water system are dealt with by one section while another section is responsible for the sewerage system. The third section is concerned with planning, design and construction of both water supply and sewerage projects. Due to difficulty in obtaining qualified people to staff these sections, work in the third section is now limited to overall supervision of work done under consultants, general planning, and design and construction of minor extensions in the water supply system. The responsibility for planning, deisgn and construction of sewerage works has fallen on the Sewerage Operations and Maintenance Section with the help of consultants. Fortunately, to date such work has only been minor, and the Section has been able to cope despite the fact that the Section is still not fully manned.

32. The Deputy Manager (Commercial) is responsible for finance, billing, collection and accounting for water supply and sewerage under the general supervision and audit of the City Treasurer. The commercial section has the responsibility for meter reading, billing, monitoring of delinquent accounts, and approving connections and disconnections. Water supply and sewerage bills are processed using the NCC computer and are mailed or hand delivered. Payments for water supply and sewerage bills are collected by the City Treasurer's staff for the department and the amounts collected are then posted to the department's accounts.

33. Materials and equipment used in water and sewerage operations are at present kept in the City Central Stores and at the treatment plants. A separate stores operation is planned for the department and construction of the structure is nearing completion.

34. Ever since its establishment, WSD has experienced serious difficulty in recruiting qualified staff to man its organization. At the date of the last Bank Mission (E. A. Projects) in October 1974, over 40% of its about 40 approved professional positions were vacant. Of the professional staff in service, at least 50% are expatriates holding the more senior positions, some of whom have contracts which would expire in a few months. The Department has made various extraordinary efforts to recruit professional staff locally and abroad, and has so far had only limited success due to the non-competitiveness of the salary offered by NCC. Despite the staff shortage the department has so far been able to carry out its functions without severe mishaps.

35. In one of their study reports dated June 1974, SWECO has proposed reorganization of the department to take into account the growing importance of sewerage works, and procedural reformation to help streamline the operations of the department. This report has the support of the Bank mission members and has now been approved in principle by NCC. It was agreed during the negotiations that NCC will undertake to prepare and submit to the Bank by September 30, 1975 a plan of implementation based on these recommendations.

## F. Sewerage Service

36. The Water and Sewerage Department charges a one-time charge for sewerage service to new users, and a use charge based on water consumption.

37. The sewerage service charge is charged to the plot owner and is in two parts:

1. A charge to recover part of the cost of constructing service trunk and reticulation sewers to serve the plot. The formula at present used by NCC is that the cost of all sewers of diameters 230 m.m. (9 inches) and below which are within the area under development are entirely borne by the plot holders. For sewers larger than 230 m.m. the plot holders pay only the cost of an equivalent 230 m.m. sewer and NCC bears the rest of the cost. Apportionment of cost to plot holders is based on plot size. Sewerage service charges are due upon notification by NCC after apportionment, and can be paid either in a lump sum or in equal installments over a period of not exceeding 10 years at 8% interest on outstanding balance. There is usually a lag of about one year between the time of completion of sewer construction and the lump sum or first installment payment of the service charge.

2. A connection fee of KShs50 for a normal domestic user. Connection fees for larger users are based on actual cost. These fees are due before the connection is made.

38. Sewerage use charge is based on water consumption, and is billed together with the water charges. The present sewerage use rate is K Shs0.88/$m^3$ (K Shs4.0/1000 Ig) of water consumed with a minimum charge of K Shs8.50 per month. Some rebates are given to a few consumers who can prove that a substantial amount of the water used is not discharged into the sewerage system.

39. Some large developers may elect to construct part or all of the reticulation sewers which will serve the lots they are developing. In this case the sewers will have to be constructed to WSD's specifications and be handed over to be maintained by the department on completion.

40. In general all newly developed areas will receive sewerage service if they lie within the areas which are or planned to be sewered by the department. The present policy of the department regarding service to new areas is based on economics: the department has found that sewerage service to areas with a population density of less than 30 persons per hectare does not pay off. For low population density areas WSD recommends the use of septic tanks or conservancy cesspools. WSD provides emptying service for a charge on a per load basis.

41. Properties which are not connected to the sewerage system will be required by statute to do so as soon as a sewer is laid within 70 yards of the plots. The plot-holders are given a period of 3 months to comply with this regulation. Some difficulty is encountered by WSD in enforcing this regulation, particularly with older properties which require expensive modifications to the plumbing system and where property values are not expected to be enhanced much with the sewer connection.

## G. Financial Aspects

### Accounting and Audits

42. All water supply and sewerage accounts have been separated from the rest of the City Council's accounts since the establishment of the WSD in 1970. Together with the City Council's accounts, they are computerized and maintained by the City Treasurer's Department. The City Council normally maintains one bank account for the deposit of cash generated by its various departments; however, WSD has, in agreement with the City Treasurer, opened its separate bank account effective July 1, 1974.

43. Audit responsibility rests with the Auditor General who has contracted two private auditing firms (Gill & Johnson, and Pannell, Bellhouse, Mwangi & Co.) to jointly audit the accounts of the entire City Council, including those of the WSD. Because of the delay in closing the accounts and the lengthy review process before audited accounts are finalized and published, the City Council has not been able to meet the requirement under Loan 714-KE of submitting to the Bank audited annual accounts within six months after the close of the fiscal year. During a supervision mission in June 1974, it was agreed that WSD's accounts will be audited separately from other City Council's accounts by these private independent auditors, and will be submitted to the Bank together with the auditors' report within six months after the close of the fiscal year. This arrangement is satisfactory under existing circumstances.

### Operating Results and Financial Position

44. WSD's income statements for water supply operations for the three years ending December 31, 1974 are shown on Table 4. While revenues have

conformed to estimates made during the appraisal of Loan 714-KE, operating expenses have been higher by 30% in 1972 to 50% in 1974. The rate of return, defined in the loan covenant as income before depreciation and interest divided by gross fixed assets revalued annually from a cost index for Nairobi, has fallen to 6.6% in 1973, which is below the required 7.5%. Trying to correct the situation, NCC has increased the water tariff effective March 1, 1975 from K Sh1.43 per cubic meter (KSh6.5 per thousand Ig) to K Sh1.76 per cubic meter (K Sh8.0 per thousand Ig). A further increase to K Sh2.2 per cubic meter (K Sh10.0 per thousand Ig) by the end of 1975 is under consideration by NCC.

45. WSD's income statement for sewerage operations for the year ending December 1973 is shown on Table 5. Although operating income is well below the Loan 714-KE appraisal estimates, WSD has amply met the requirement under this Loan of generating sufficient revenues to cover operating expenses for its sewerage and waste disposal services and to meet debt service on long-term loans incurred for such services. In order to increase its internal cash generation for the financing of the First Stage Sewerage Program, NCC has increased the sewerage use rate from K Sh0.77 per cubic meter (K Sh3.5 per thousand Ig) of metered water consumption to K Sh0.88 per cubic meter (K Sh4.0 per thousand Ig) effective March 1, 1975. A further increase to K Sh1.1 per cubic meter (K Sh5.0 per thousand Ig) before the end of 1975 is under consideration by NCC.

46. Provisional water supply and sewerage balance sheets as of December 31, 1973 are shown on Table 5. WSD's overall financial situation has been viable with a very strong liquidity position. It has accumulated cash of the order of KE 1.6 million at the end of 1973. With assets valued at historical costs, the debt/equity ratio is 61:39, as compared to 74:26 at the time of appraisal of Loan 714-KE. Nevertheless, WSD has had serious arrears problem. Its accounts receivable amounted to almost KE 0.7 million at the end of 1973 which was equivalent to about 3.7 months of billings. WSD has recently embarked on an intensive collection program, and it is expected that its arrears situation will improve substantially.

Financing Plan

47. The financing plan for sewerage during the five-year period 1975 through 1979, which is extracted from the detailed funds flow projections on Tables 6 to 9, is shown below:

| Application of Funds | KE Thousand | US$ Thousand | % |
|---|---|---|---|
| Off-Site Sewerage Works incorporated in Site and Service Project | 3,604 | 10,091 | 35.5 |
| Other Works of the First Stage Program | 5,864 | 16,420 | 57.8 |
| Interest during construction | 687 | 1,923 | 6.7 |
| Total Construction Cost | 10,155 | 28,434 | 100.0 |
| **Sources of Funds** | | | |
| Proposed IBRD Loan | 1,982 | 5,550 | 19.5 |
| Government Loan | 1,622 | 4,542 | 16.0 |
| Other Loans | 2,700 | 7,560 | 26.6 |
| Total Borrowings | 6,304 | 17,652 | 62.1 |
| **Internal cash generation** | 4,739 | 13,269 | 46.7 |
| Less: Debt service | 1,850 | 5,180 | 18.2 |
| Net Internal cash generation | 2,889 | 8,089 | 28.5 |
| Contributions from Customers | 674 | 1,887 | 6.6 |
| Decrease in working capital | 288 | 806 | 2.8 |
| Total Sources of Funds | 10,155 | 28,434 | 100.0 |

48. It was agreed during the negotiations that the Bank will finance 55% of the costs of the off-site sewerage works incorporated in the Site and Service Project with a loan of about KE2.0 million equivalent, which will bear 8.5% interest for a period of 25 years including four years of grace. It was also agreed that the Government will finance the remaining 45% with a loan of KE1.6 million at 6.5% interest for a period of 25 years including 4 years of grace.

49. It has been assumed that WSD will be able to contract other loans totalling KE2.5 million at 8% interest for 15 years without grace, to fill the financing gap required to implement, as planned, the entire First Stage Sewerage Program for Nairobi during 1974-1979. In the event that WSD cannot raise such funds, WSD's internally generated cash combined with customers' contributions and the loans mentioned in para. 48 above could still enable a major part (73%) of the First Stage Program to be implemented inasmuch as this stage can be phased as noted earlier in paragraph 9.

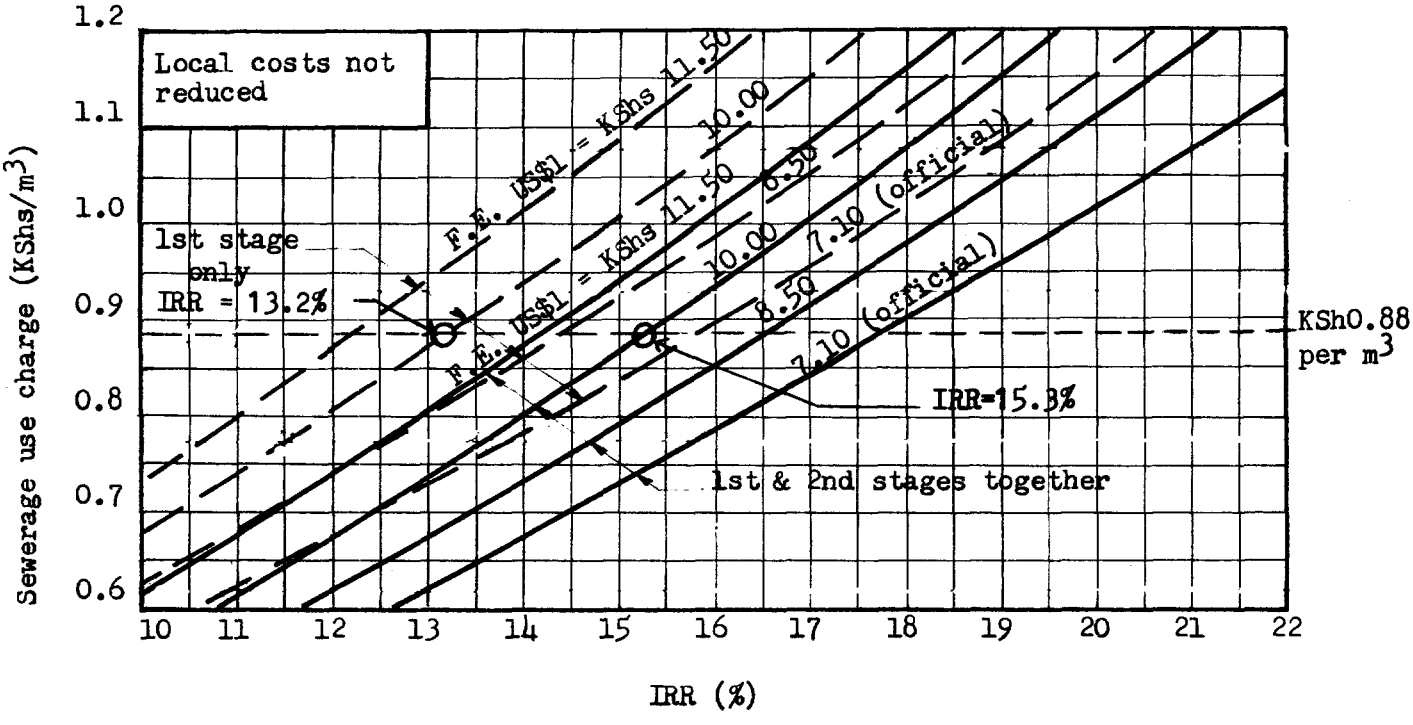
Future Operations

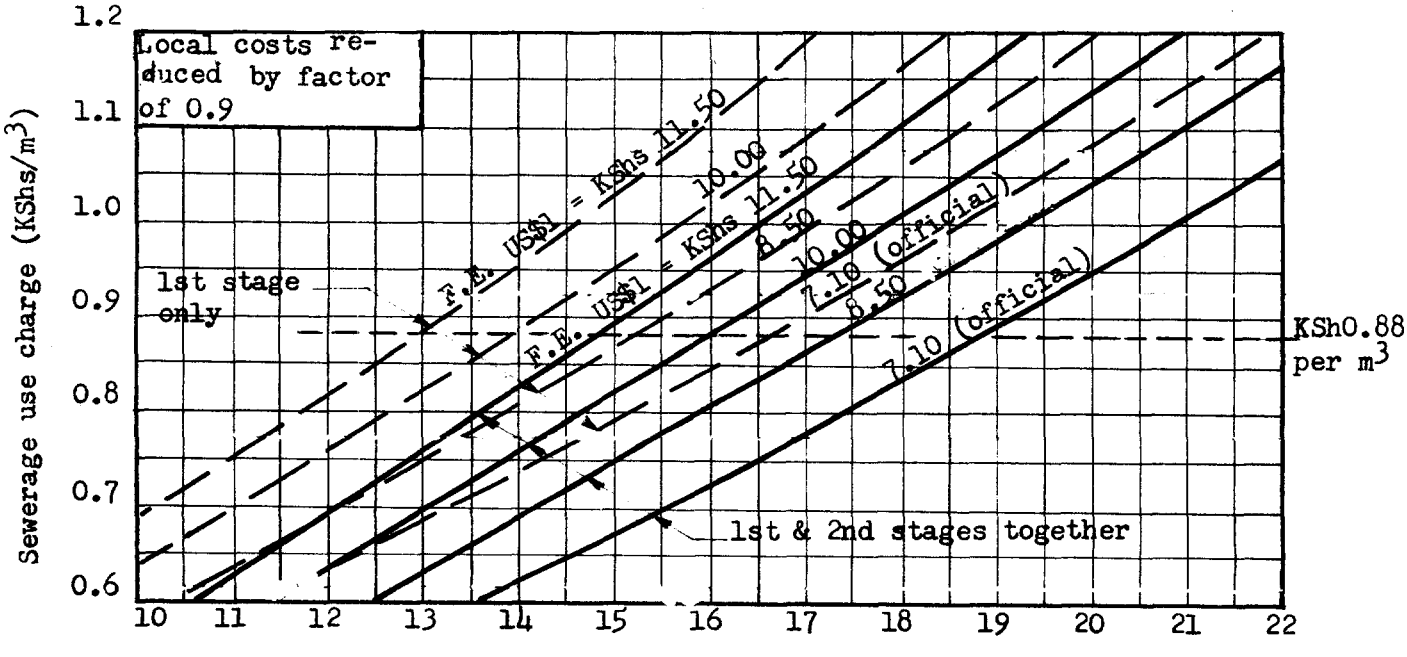
50. Results of WSD's sewerage operations for the years 1974 through 1979 are shown in the income statements on Table 7. Revenues are projected to more than double, from about KE0.7 million in 1974 to KE1.7 million in 1979. Internal cash generation is expected to increase three-fold, from KE0.4 million in 1974 to KE1.2 million in 1979. Debt service coverage will be at least 1.60 during this entire period.

**Figure 1**

NAIROBI SEWERAGE PROGRAM

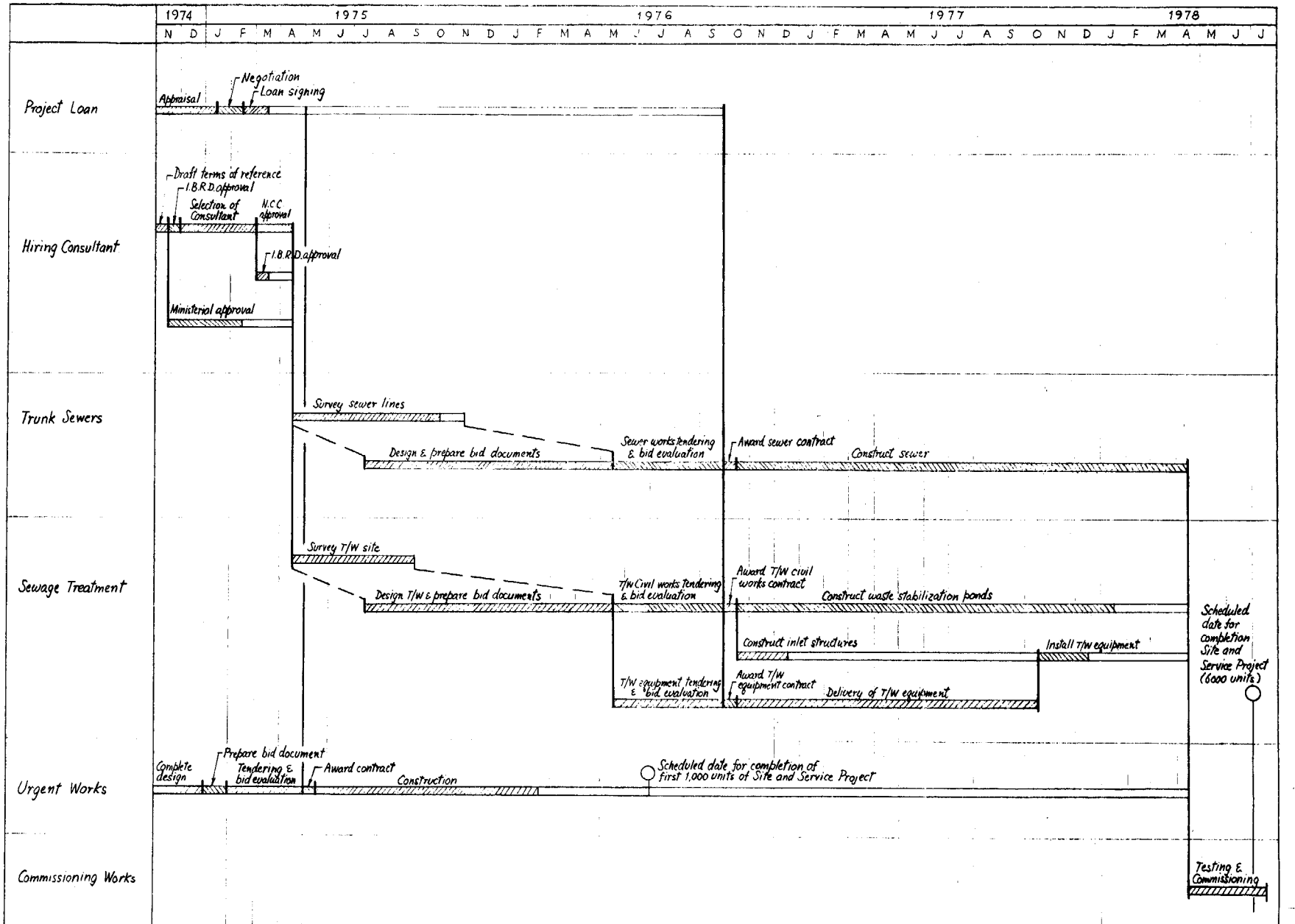
IRR and Sensitivity Analysis



# Off-site Sewerage Works for Site and Service Project

## Work Schedule




ANNEX 6
Page 16
Figure 2

# K E N Y A

## NAIROBI CITY COUNCIL

## Water & Sewerage Department

## Capital Works Program

(K£ Thousand)

(@ Jan. 1974 Prices Incl. 15% Physical Contingency and 10% Design & Supervision)

| | Items | Cost up to End 1973 | 1974 | 1975 | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | Total | To be Recovered from Plot Owners % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| I. | Trunk Sewers | | | | | | | | | | | | |
| A 1 | Industrial Area | 170 | 100 | 10 | | | | | | | | 280 | 5 |
| A 2 | Chiromo Phase I | | 30 | 40 | | | | | | | | 70 | 40 |
| A 3 | Chiromo Phase II | | | 60 | 20 | | | | | | | 80 | 50 |
| A 4 | Thompson Estate | | | | 85 | 28 | 7 | | | | | 120 | 50 |
| A 5 | Riruta North | | | | | 35 | 23 | | | | | 58 | 60 |
| A 6 | Riruta South | | | | | 47 | 23 | | | | | 70 | 60 |
| A 7 | Nairobi River Valley VI | | | 10 | 30 | | | | | | | 40 | 60 |
| A 8 | Nairobi River Valley VII | | | | 25 | 127 | | | | | | 152 | 60 |
| A 9 | Nairobi River Valley VIII | | | | | | 50 | 38 | | | | 88 | 60 |
| A 10 | Southern Trunk Sewer | | | 30 | | | | | | | | 30 | 5 |
| A 13 | Dandora Industrial Area | | | | 60 | 50 | 10 | | | | | 120 | 0 |
| A 14 | Kariobangi S.T.W. to A7 | | | | | 300 | 150 | 50 | | | | 500 | 0 |
| A 15 | Ruaraka | | | | | 121 | 12 | | | | | 133 | 60 |
| A 16 | Gitathura | | | | | 44 | 6 | | | | | 50 | 0 |
| A 17 | Kahawa West | | | 5 | 10 | | | | | | | 15 | 90 |
| A 18 | AID Housing, Kariobangi | | | | 25 | 5 | | | | | | 30 | 0 |
| A 19 | Muthiaga | | | | 10 | 5 | | | | | | 15 | 90 |
| A 20 | Bahati River Crossing | | | | 15 | | | | | | | 15 | 0 |
| | Others | | | 10 | 10 | 10 | 10 | 100 | | | | 140 | 18 |
| | Future | | | | | | | | 300 | 300 | 300 | 900 | 18 |
| | Total Trunk Sewers (N.C.C.) | 170 | 130 | 165 | 293 | 772 | 291 | 188 | 300 | 300 | 300 | 2,906 | |
| A 11 | IBRD Dandora | | | 44 | 17 | 114 | | | | | | 175 | |
| A 12 | Dandora Trunk A7 to S.T.W."D" (IBRD) | | | 37 | 182 | 752 | 396 | 43 | | | | 1,410 | |
| | Total Trunk Sewers (IBRD) | - | - | 81 | 199 | 866 | 396 | 43 | - | - | - | 1,585 | |
| II. | Sewer Reticulation | | | | | | | | | | | | |
| B 1 | Hill Area III | 40 | 30 | 5 | | | | | | | | 75 | 80 |
| B 2 | Upper Parklands | | 5 | 50 | 10 | 5 | | | | | | 70 | 90 |
| B 3 | Nairobi River Valley V | | | 60 | 50 | 10 | | | | | | 120 | 100 |
| B 4 | Nairobi River Valley VI | | | | 60 | 30 | 10 | | | | | 100 | 100 |
| B 5 | Chiromo I | | | 20 | 25 | 10 | | | | | | 55 | 100 |
| B 6 | Chiromo II | | | 30 | 80 | 30 | 10 | | | | | 150 | 100 |
| B 7 | Thompson Estate | | | | | 100 | 100 | 40 | 10 | | | 250 | 100 |
| B 8 | Kangemi | | | | | | 60 | 50 | 10 | | | 120 | 100 |
| B 9 | Kawangware | | | | | | 40 | 15 | 5 | | | 60 | 100 |
| B 10 | Riruta | | | | | | 30 | 15 | 5 | | | 50 | 100 |
| B 11 | Waithaka | | | | | 20 | | | | | | 20 | 100 |
| B 12 | Others | | | 10 | 10 | 10 | 10 | 10 | 10 | | | 60 | 100 |
| | Future | | | | | | | | | 200 | 200 | 400 | 95 |
| | Total Reticulation (N.C.C.) | 40 | 35 | 175 | 235 | 215 | 260 | 130 | 40 | 200 | 200 | 1,530 | |
| III. | Treatment Works | | | | | | | | | | | | |
| C 1 | Industrial Area I | 25 | 60 | 40 | | | | | | | | 125 | |
| C 2 | Industrial Area II | | 60 | 5 | | | | | | | | 65 | |
| C 3 | Kahawa | | | 20 | | | | | | | | 20 | |
| C 4 | Kariobangi Improvements | | | 20 | 5 | | | | | | | 25 | |
| C 7 | Land | | | 60 1/ | 440 | | | | | | | 500 | |
| | Dandora Estate (Phase II) | | | | | | 210 | 210 | | | | 420 | |
| | Future | | | | | | | | 300 | 300 | 300 | 900 | |
| | Total S.T.W. (N.C.C.) | 25 | 120 | 145 | 445 | - | 210 | 210 | 300 | 300 | 300 | 2,055 | |
| C 5 | Dandora Estate (Phase I) | | | 15 | 68 | 325 | 141 | 16 | | | | 565 | |
| | Temporary Ponds Dandora | | | 12 | | | | | | | | 12 | |
| | Total S.T.W. (IBRD) | - | - | 27 | 68 | 325 | 141 | 16 | - | - | - | 577 | |

1/ Land included in IBRD Site and Service Project.

IBRD
January 8, 1975

K E N Y A

NAIROBI CITY COUNCIL

Water & Sewerage Department

Capital Works Program
(Kℓ Thousand)

(@ Escalated Prices Including 15% Physical Contingency & 10% Design & Supervision)

| | Items | Cost up to End 1973 | 1974 | 1975 | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | Total | To be Recovered from Plot Owners % | To be Recovered from Plot Owners Amount Kℓ Thousand |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| I. | Trunk Sewers | | | | | | | | | | | | | |
| A 1 | Industrial Area | 170.0 | 109.0 | 12.7 | | | | | | | | 291.7 | 5 | 14.6 |
| A 2 | Chiromo Phase I | | 32.7 | 50.8 | | | | | | | | 83.5 | 40 | 33.4 |
| A 3 | Chiromo Phase II | | | 76.2 | 28.8 | | | | | | | 105.0 | 50 | 52.5 |
| A 4 | Thompson Estate | | | | 122.4 | 45.1 | 12.6 | | | | | 180.1 | 50 | 90.0 |
| A 5 | Riruta North | | | | | 56.4 | 41.4 | | | | | 97.8 | 60 | 58.7 |
| A 6 | Riruta South | | | | | 75.7 | 41.4 | | | | | 117.1 | 60 | 70.3 |
| A 7 | Nairobi River Valley VI | | | 12.7 | 43.2 | | | | | | | 55.9 | 60 | 33.6 |
| A 8 | Nairobi River Valley VII | | | | 36.0 | 204.5 | | | | | | 240.5 | 60 | 144.3 |
| A 9 | Nairobi River Valley VIII | | | | | | 90.0 | 76.8 | | | | 166.8 | 60 | 100.0 |
| A 10 | Southern Trunk Sewer | | | 38.1 | | | | | | | | 38.1 | 5 | 1.9 |
| | | | | | | | | | | | | | | - |
| A 13 | Dandora Industrial Area | | | | 86.4 | 80.5 | 18.0 | | | | | 184.9 | 0 | - |
| A 14 | Kariobangi S.T.W. to A7 | | | | | 483.0 | 270.0 | 101.0 | | | | 854.0 | 0 | - |
| A 15 | Ruaraka | | | | | 194.8 | 21.6 | | | | | 216.4 | 60 | 129.9 |
| A 16 | Citathura | | | | | 70.8 | 10.8 | | | | | 81.6 | 0 | - |
| A 17 | Kahawa West | | | 6.4 | 14.4 | | | | | | | 20.8 | 90 | 18.7 |
| A 18 | AID Housing, Kariobangi | | | | 36.0 | 8.1 | | | | | | 44.1 | 0 | - |
| A 19 | Methiaga | | | | 14.4 | 8.1 | | | | | | 22.5 | 90 | 20.3 |
| A 20 | Bahati River Crossing | | | | 21.6 | | | | | | | 21.6 | 0 | - |
| | Others | | | 12.7 | 14.4 | 16.1 | 18.0 | 202.0 | | | | 263.2 | 18 | 47.4 |
| | Future | | | | | | | | 678.0 | 759.0 | 852.0 | 2,289.0 | 18 | 412.0 |
| | Total Trunk Sewers (N.C.C.) | 170.0 | 141.7 | 209.6 | 417.6 | 1,243.1 | 523.8 | 379.8 | 678.0 | 759.0 | 852.0 | 5,374.6 | | 1,227.6 |
| A 11 | IBRD Dandora N & W Sewers | | | 55.9 | 24.5 | 183.5 | | | | | | 263.9 | | |
| A 12 | IBRD Dandora Trunk A7 to S.T.W."D" | | | 46.9 | 262.1 | 1,210.7 | 712.8 | 87.9 | | | | 2,320.4 | | |
| | Total Trunk Sewers (IBRD) | - | - | 102.8 | 286.6 | 1,394.2 | 712.8 | 87.9 | - | - | - | 2,584.3 | | |
| II. | Sewer Reticulation | | | | | | | | | | | | | |
| B 1 | Hill Area III | 40.0 | 32.7 | 6.4 | | | | | | | | 79.1 | 80 | 63.3 |
| B 2 | Upper Parklands | | 5.5 | 63.5 | 14.4 | 8.1 | | | | | | 91.5 | 90 | 82.4 |
| B 3 | Nairobi River Valley V | | | 76.2 | 72.0 | 16.1 | | | | | | 164.3 | 100 | 164.3 |
| B 4 | Nairobi River Valley VI | | | | 86.4 | 48.3 | 18.0 | | | | | 152.7 | 100 | 152.7 |
| B 5 | Chiromo I | | | 25.4 | 36.0 | 16.1 | | | | | | 77.5 | 100 | 77.5 |
| B 6 | Chiromo II | | | 38.1 | 115.2 | 48.3 | 18.0 | | | | | 219.6 | 100 | 219.6 |
| B 7 | Thompson Estate | | | | | 161.0 | 180.0 | 80.8 | 22.6 | | | 444.4 | 100 | 444.4 |
| B 8 | Kangemi | | | | | | 108.0 | 101.0 | 22.6 | | | 231.6 | 100 | 231.6 |
| B 9 | Kawangware | | | | | | 72.0 | 30.3 | 11.3 | | | 113.6 | 100 | 113.6 |
| B 10 | Riruta | | | | | | 54.0 | 30.3 | 11.3 | | | 95.6 | 100 | 95.6 |
| B 11 | Waithaka | | | | | 32.2 | | | | | | 32.2 | 100 | 32.2 |
| B 12 | Others | | | 12.7 | 14.4 | 16.1 | 18.0 | 20.2 | 22.6 | | | 104.0 | 100 | 104.0 |
| | Future | | | | | | | | | 506.0 | 568.0 | 1,074.0 | 95 | 1,020.3 |
| | Total Reticulation (N.C.C.) | 40.0 | 38.2 | 222.3 | 338.4 | 346.2 | 468.0 | 262.6 | 90.4 | 506.0 | 568.0 | 2,880.1 | | 2,801.5 |
| III. | Treatment Works | | | | | | | | | | | | | |
| C 1 | Industrial Area I | 25.0 | 65.4 | 50.8 | | | | | | | | 141.2 | | |
| C 2 | Industrial Area II | | 65.4 | 6.4 | | | | | | | | 71.8 | | |
| C 3 | Kahawa | | | 25.4 | | | | | | | | 25.4 | | |
| C 4 | Kariobangi Improvements | | | 25.4 | 7.2 | | | | | | | 32.6 | | |
| C 7 | Land | | | 76.2 1/ | 633.6 | | | | | | | 709.8 | | |
| | Dandora Estate (Phase II) | | | | | | 378.0 | 424.2 | | | | 802.2 | | |
| | Future | | | | | | | | 678.0 | 759.0 | 852.0 | 2,289.0 | | |
| | Total S.T.W. (N.C.C.) | 25.0 | 130.8 | 184.2 | 640.8 | - | 378.0 | 424.2 | 678.0 | 759.0 | 852.0 | 4,072.0 | | |
| C 5 | Dandora Estate (Phase I) | | | 19.0 | 98.0 | 523.0 | 253.8 | 32.3 | | | | 926.1 | | |
| | Temporary Ponds Dandora | | | 15.3 | | | | | | | | 15.3 | | |
| | Total S.T.W. (IBRD) | - | - | 34.3 | 98.0 | 523.0 | 253.8 | 32.3 | - | - | - | 941.4 | | |

1/ Land included in IBRD Site and Service Project.

IBRD
January 8, 1975

KENYA

APPRAISAL OF A SITE AND SERVICE PROJECT

Projected Water Demand and Wastewater Flows

| Year | Water Demand (Av.) | | Wastewater Flows (Av.) | |
|---|---|---|---|---|
| | IMDG | $m^3$/day | IMGD | $m^3$/day |
| 1972 | 16.6 | 75,400 | 11.0 | 50,000 |
| 1973 | 18.0 | 81,800 | 12.1 | 55,000 |
| 1974 | 19.4 | 88,200 | 13.5 | 61,200 |
| 1975 | 21.0 | 95,400 | 14.9 | 67,800 |
| 1976 | 24.0 | 109,100 | 16.5 | 75,200 |
| 1977 | 26.4 | 120,000 | 18.3 | 83,100 |
| 1978 | 28.7 | 130,400 | 20.3 | 92,200 |
| 1979 | 31.0 | 140,900 | 22.2 | 101,000 |
| 1980 | 33.2 | 150,900 | 24.7 | 112,100 |
| 1981 | 35.6 | 161,800 | 27.2 | 123,400 |
| 1982 | 37.9 | 172,300 | 29.8 | 135,600 |
| 1983 | 40.3 | 183,200 | 32.9 | 149,400 |
| 1984 | 43.0 | 195,400 | 36.0 | 163,400 |
| 1985 | 45.6 | 207,300 | 39.2 | 178,200 |
| Av. growth (1972 to 1985) | | 8.1% p.a. | | 10.3% p.a. |

KENYA
NAIROBI CITY COUNCIL
Water Supply and Sewerage Department

INCOME STATEMENTS
WATER SUPPLY OPERATIONS
(KL thousands)

| Year Ending December 31 | 1972 | | 1973 | | 1974 | |
|---|---|---|---|---|---|---|
| | Actual | IBRD Appr. Estimate | Pre-Audited 1/ | IBRD Appr. Forecast | Current Estimate | IBRD Appr. Forecast |
| Volume Produced (thousands of $m^3$) | 28,592 | 28,579 | 27,970 | 30,756 | 33,088 | 32,515 |
| Volume Sold (thousands of $m^3$) | 23,420 | 24,293 | 22,657 | 26,143 | 27,134 | 27,638 |
| Unaccounted for Water | 18% | 15% | 19% | 15% | 18% | 15% |
| Water Price (KSh/$m^3$) or | 1.43 | 1.31 | 1.43 | 1.31 | 1.43 | 1.31 |
| (KSh/thousand gallons) | (6.5) | (5.97) | (6.5) | (5.97) | (6.5) | (5.97) |
| Number of Connections | 37,602 | 36,130 | 41,370 | 40,090 | 45,000 | 42,090 |
| REVENUES | | | | | | |
| Water Billings | 1,658 | 1,596 | 1,620 | 1,717 | 1,940 | 1,815 |
| Other | 131 | 87 | 90 | 91 | 104 | 96 |
| TOTAL REVENUE | 1,789 | 1,683 | 1,710 | 1,808 | 2,044 | 1,911 |
| OPERATING EXPENSES | | | | | | |
| Labor | 36 | 42 | 35 | 44 | 76 | 51 |
| Chemical | 31 | 38 | 32 | 41 | 68 | 48 |
| Power & Fuel | 2 | 2 | 24 | 2 | 32 | 20 |
| General & Administration | 443 | 316 | 486 | 334 | 620 | 418 |
| TOTAL OPERATING EXPENSES | 512 | 398 | 577 | 421 | 796 | 537 |
| INCOME BEFORE DEPRECIATION | 1,277 | 1,285 | 1,133 | 1,387 | 1,248 | 1,374 |
| Depreciation | 197 | 272 | 202 | 273 | 191 | 273 |
| Interest | 274 | 301 | 286 | 287 | 288 | 273 |
| INCOME AFTER DEPRECIATION & INTEREST | 806 | 712 | 645 | 827 | 769 | 828 |
| NON-OPERATING INCOME | 17 | 16 | 81 | 16 | 71 | 16 |
| NET INCOME | 823 | 728 | 726 | 843 | 840 | 844 |
| Return on Gross Fixed Assets 2/ | 7.6% | 8.4% | 6.6% | 9.0% | 6.1% | 8.9% |

1/ Subject to audit.

2/ Defined as income before depreciation and interest divided by gross fixed assets revalued annually by Government indices.

December 16, 1974

KENYA

NAIROBI CITY COUNCIL

WATER AND SEWERAGE DEPARTMENT

Provisional Balance Sheets as of December 31, 1973
(K£ Thousand)

| Assets | Water | Sewerage | Consolidated |
|---|---|---|---|
| Net assets in operation | 5,255 | 2,430 | 7,685 |
| Work in progress | 2,756 | 192 | 2,948 |
| Total fixed assets | 8,011 | 2,622 | 10,633 |
| Accounts receivable | 487 | 199 | 686 |
| Less: Bad debt reserve | (57) | (23) | (80) |
| | 430 | 176 | 606 |
| Cash and bank deposits | 1,150 | 432 | 1,582 |
| Other current assets | 207 | 3 | 210 |
| Total current assets | 1,787 | 611 | 2,398 |
| Other assets | 117 | 80 | 197 |
| Total assets | 9,915 | 3,313 | 13,228 |
| **Equity and Liabilities** | | | |
| Total equity | 3,572 | 1,403 | 4,975 |
| Long-term debt | 5,928 | 1,883 | 7,811 |
| Less: Current maturities | (191) | (93) | (284) |
| | 5,737 | 1,790 | 7,527 |
| Accounts payable | 52 | 15 | 67 |
| Customer deposits | 235 | 8 | 243 |
| Current maturities | 191 | 93 | 284 |
| Total current liabilities | 478 | 116 | 594 |
| Other liabilities | 128 | 4 | 132 |
| Total equity and liabilities | 9,915 | 3,313 | 13,228 |

KENYA

NAIROBI CITY COUNCIL

WATER AND SEWERAGE DEPARTMENT

## Financial Projections for Sewerage Operations

## Notes and Assumptions

### Income Statements

#### Sewerage Billings

Billings have been calculated on the assumption that sewerage tariff will be increased from the present K Sh 4.0 per thousand Ig of water consumed (effective March 1, 1975) to K Sh 5.0 effective January 1, 1976. Sewage collection volume has been based on estimated population connected to the sewer system and per capita water consumption in each class of population.

#### Operation Expenses

Salaries, supplies and general and administrative expenses have been assumed to increase by 10% per annum.

Labor has been projected to increase by 10% per annum except for 1976 and 1978 during which years bonus increases of 8% have been added.

Expenses for power have been estimated to increase by 30%, 25%, 20%, 15% and 10% during 1975 to 1979, respectively.

#### Depreciation

Depreciation has been calculated on a straight line basis at an average rate of 2.5% of fixed assets in operation other than land.

### Balance Sheets

#### Work in Progress

Work in progress has been transferred to assets in operation in the year of completion.

#### Construction Works

It has been assumed that the entire First Stage (1974-1979) of the sewerage development program for Nairobi will be implemented as planned. This first Stage includes, amongst other things, trunk sewers to and sewage treatment plant at site "D".

Loans

The IBRD loan of KE2.0 million will be on-lend to the Nairobi City Council/WSD at 8.5% interest for a period of 25 years, including four years of grace, repayable through equal annual (or semi-annual) level payments of principal and interest combined, commencing in 1979. The Government loan of KE1.6 million will carry a 6.5% interest for 25 years including 4 years of grace. All interests on these loans during the construction period have been capitalized.

It has also been assumed that loans other than the above to be contracted for implementing the rest of the First Stage Sewerage Program would carry an interest rate of 8% per annum and repayable in 15 years without grace through equal annual level payments of principal and interest combined. Fifty percent of the interests on these loans during the construction period have been capitalized.

Customers' Contributions

Percentages of the expenditures for reticulation systems to be recovered from the customers are given in Tables 1 & 2. The Water and Sewerage Department normally offers these customers the choice of paying such amounts either immediately in full or over a period of ten years including an 8% interest. It has been assumed, based on past experience, that 40% of the customers would pay immediately their shares.

Accounts Payable

Accounts payable has been assumed to increase by 10% each year.

Accounts Receivable

Accounts receivable has been assumed to reduce to 20% of billings at the end of 1975 and further to 17.0% at the end of each year thereafter.

K E N Y A

NAIROBI CITY COUNCIL

WATER AND SEWERAGE DEPARTMENT

OPERATING STATEMENT PROJECTIONS (SEWERAGE)
(KL THOUSANDS)

| YEAR ENDING DEC. 31 | PROVISIONAL 1973 | PROVISIONAL 1974 | FORECAST 1975 | FORECAST 1976 | FORECAST 1977 | FORECAST 1978 | FORECAST 1979 |
|---|---|---|---|---|---|---|---|
| AVE.SEW.VOL.COLLECTED | 3577 | 4143 | 4642 | 5109 | 5617 | 6163 | 6762 |
| SEW.PRICE (KSH/1000IG) | 3.5 | 3.5 | 3.92 | 5.0 | 5.0 | 5.0 | 5.0 |
| OPERATING REVENUES | | | | | | | |
| SEWERAGE BILLINGS | 626 | 725 | 909 | 1277 | 1404 | 1541 | 1690 |
| OTHER | 13 | 14 | 15 | 16 | 17 | 18 | 19 |
| | 639 | 739 | 924 | 1293 | 1421 | 1559 | 1709 |
| OPERATING EXPENSE | | | | | | | |
| LABOR | 52 | 62 | 68 | 80 | 89 | 104 | 115 |
| SALARIES | 82 | 90 | 99 | 109 | 120 | 132 | 145 |
| POWER | 10 | 20 | 26 | 32 | 39 | 45 | 49 |
| SUPPLIES | 28 | 34 | 37 | 41 | 45 | 50 | 55 |
| ADMINIST-GENERAL | 108 | 119 | 131 | 144 | 158 | 174 | 192 |
| OTHER | 1 | 1 | 1 | 2 | 2 | 2 | 3 |
| DEPRECIATION | 87 | 92 | 99 | 110 | 125 | 167 | 229 |
| TOTAL OP EXPENSE | 368 | 418 | 461 | 518 | 578 | 674 | 788 |
| OPERATING INCOME | 271 | 321 | 463 | 775 | 843 | 885 | 921 |
| OTHER INCOME-NET | 5 | 5 | 5 | 6 | 11 | 37 | 63 |
| NET INCOME BEF.INT | 276 | 326 | 468 | 781 | 854 | 922 | 984 |
| INTEREST NOT CAPIT | 120 | 114 | 110 | 116 | 152 | 170 | 446 |
| NET INCOME | 156 | 212 | 358 | 665 | 702 | 752 | 538 |
| OPERATING RATIO % (BEFORE DEPREC.) | 44 | 44 | 39 | 32 | 32 | 33 | 33 |
| OPERATING RATIO % (AFTER DEPREC.) | 58 | 57 | 50 | 40 | 41 | 43 | 46 |

MARCH 14, 1975

K E N Y A

NAIROBI CITY COUNCIL

WATER AND SEWERAGE DEPARTMENT

BALANCE SHEETS PROJECTIONS (SEWERAGE)
(KE THOUSANDS)

| YEAR ENDING DEC. 31 | PROVISIONAL 1973 | 1974 | FORECAST 1975 | 1976 | 1977 | 1978 | 1979 |
|---|---|---|---|---|---|---|---|
| ASSETS | | | | | | | |
| FIXED ASSETS | | | | | | | |
| GROSS IN OPERATION | 3583 | 3775 | 4237 | 5389 | 6006 | 8757 | 11024 |
| LESS:DEPRECIATION | 1153 | 1245 | 1344 | 1454 | 1579 | 1746 | 1975 |
| NET IN OPERATION | 2430 | 2530 | 2893 | 3935 | 4427 | 7011 | 9049 |
| WORK IN PROGRESS | 192 | 142 | 455 | 1145 | 4223 | 4023 | 3048 |
| SUBTOTAL | 2622 | 2672 | 3348 | 5080 | 8650 | 11034 | 12097 |
| CURRENT ASSETS | | | | | | | |
| INVENTORIES | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| ACCOUNTSRECEIVABLE | 199 | 196 | 236 | 229 | 253 | 272 | 286 |
| LESS: BAD DEBT RESERVE | 23 | 24 | 35 | 40 | 45 | 48 | 51 |
| | 176 | 172 | 201 | 189 | 208 | 224 | 235 |
| CASH | 432 | 508 | 279 | 103 | 44 | 85 | 173 |
| SUBTOTAL | 611 | 684 | 485 | 298 | 259 | 317 | 417 |
| OTHER ASSETS | 80 | 80 | 80 | 80 | 80 | 80 | 80 |
| TOTAL ASSETS | 3313 | 3436 | 3913 | 5458 | 8989 | 11431 | 12594 |
| EQUITY+LIABILITIES | | | | | | | |
| EQUITY | | | | | | | |
| ACCUMULATED SURP. | 1403 | 1615 | 1983 | 2638 | 3340 | 4092 | 4630 |
| CONTRIBUTION | 0 | 0 | 0 | 57 | 117 | 367 | 674 |
| SUBTOTAL | 1403 | 1615 | 1973 | 2695 | 3457 | 4459 | 5304 |
| DEBT | | | | | | | |
| LONGTERM DEBT GROS | 1883 | 1790 | 1905 | 2724 | 5489 | 6925 | 7238 |
| LESS:CURRENT MATUR | 93 | 98 | 116 | 153 | 180 | 309 | 332 |
| LONG-TERM DEBT-NET | 1790 | 1692 | 1789 | 2571 | 5309 | 6616 | 6906 |
| CURRENT LIABILIT. | | | | | | | |
| ACCOUNTS PAYABLE | 15 | 17 | 19 | 21 | 23 | 25 | 28 |
| CUSTOMER DEPOSITS | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| CURRENT MATURITIES | 93 | 98 | 116 | 153 | 180 | 309 | 332 |
| SUBTOTAL | 116 | 124 | 145 | 185 | 215 | 347 | 374 |
| OTHER LIABILITIES | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| TOT.EQUITY+LIABIL | 3313 | 3436 | 3913 | 5458 | 8989 | 11431 | 12594 |
| DEBT AS% OF LONG-TERM CAPITALIZTION | 56 | 51 | 48 | 49 | 61 | 60 | 57 |
| CURRENT RATIO | 5.27 | 5.52 | 3.34 | 1.61 | 1.20 | 0.91 | 1.11 |

MARCH 14, 1975

KENYA

NAIROBI CITY COUNCIL

WATER AND SEWERAGE DEPARTMENT

FUND FLOW PROJECTIONS (SEWERAGE)
(K£ THOUSANDS)

| YEAR ENDING DEC. 31 | 1974 | 1975 | 1976 | 1977 | 1978 | 1979 |
|---|---|---|---|---|---|---|
| SOURCES | | | | | | |
| INTERNAL CASH GEN. | | | | | | |
| NET INCOME BEF.INT | 326 | 468 | 781 | 854 | 922 | 984 |
| DEPRECIATION | 92 | 99 | 110 | 125 | 167 | 229 |
| SUBTOTAL | 418 | 567 | 891 | 979 | 1089 | 1213 |
| CONTRIBUTIONS | | | | | | |
| TO EQUITY | 0 | 0 | 57 | 60 | 250 | 307 |
| SUBTOTAL | 0 | 0 | 57 | 60 | 250 | 307 |
| BORROWINGS | | | | | | |
| IBRD LOAN | 0 | 117 | 212 | 1055 | 531 | 67 |
| GOVT LOAN | 0 | 96 | 173 | 863 | 435 | 55 |
| OTHER LOANS | 0 | 0 | 550 | 1000 | 650 | 500 |
| SUBTOTAL | 0 | 213 | 935 | 2918 | 1616 | 622 |
| OTHER SOURCES | | | | | | |
| CHG.IN CUR.LIAB. | 3 | 3 | 3 | 3 | 3 | 4 |
| SUBTOTAL | 3 | 3 | 3 | 3 | 3 | 4 |
| TOTAL SOURCES | 421 | 783 | 1886 | 3960 | 2958 | 2146 |
| APPLICATIONS | | | | | | |
| CONSTRUCTION | | | | | | |
| OTHER WORKS OF 1ST STAGE | 142 | 540 | 1397 | 1590 | 1270 | 1067 |
| IBRD PROJECT | 0 | 213 | 385 | 1918 | 966 | 122 |
| INTEREST CAPITALIZ | 0 | 22 | 60 | 187 | 315 | 103 |
| SUBTOTAL | 142 | 775 | 1842 | 3695 | 2551 | 1292 |
| DEBT SERVICE | | | | | | |
| AMORTIZATION | 93 | 98 | 116 | 153 | 180 | 309 |
| INTEREST NOT CAP. | 114 | 110 | 116 | 152 | 170 | 446 |
| SUBTOTAL | 207 | 208 | 232 | 305 | 350 | 755 |
| OTHER APPLICATIONS | | | | | | |
| CHANGE IN CASH | 76 | -229 | -176 | -59 | 41 | 88 |
| CHG.IN OTH.CUR.ASS | -3 | 30 | -11 | 20 | 17 | 12 |
| OTHER APPLIC-NET | -1 | -1 | -1 | -1 | -1 | -1 |
| SUBTOTAL | 72 | -200 | -188 | -40 | 57 | 99 |
| TOTAL APPLICATION | 421 | 783 | 1886 | 3960 | 2958 | 2146 |
| DEBT SERVICE COVERED BY INTERNAL CASH GEN.(TIMES) | 2.02 | 2.73 | 3.84 | 3.21 | 3.11 | 1.61 |
| ACCUMULATED CASH AT END OF YEAR | 508 | 279 | 103 | 44 | 85 | 173 |

MARCH 14, 1975

KENYA

APPRAISAL OF A SITE AND SERVICE PROJECT

Nairobi Sewerage Program

Costs and Benefits - K£000's
(January 1974 prices)
(First and Second Stages Together)

| Year | Costs | | | Benefits | |
|---|---|---|---|---|---|
| | Capital[1] | | O. & M. | Costs Recovered from | Sewerage Revenue |
| | Local | Foreign | (Incremental) | Plot Holders[2] | (Incremental)[3] |
| 1 | 128 | 101 | - | - | - |
| 2 | 286 | 190 | 31 | - | 53 |
| 3 | 552 | 440 | 43 | 116 | 101 |
| 4 | 972 | 775 | 49 | 90 | 101 |
| 5 | 579 | 462 | 75 | 375 | 101 |
| 6 | 262 | 209 | 99 | 479 | 444 |
| 7 | 375 | 299 | 103 | 81 | 444 |
| 8 | 357 | 285 | 134 | 490 | 779 |
| 9 | 357 | 285 | 152 | 378 | 779 |
| 10 | 357 | 285 | 171 | 378 | 1098 |
| 11 | - | - | 189 | 378 | 1098 |
| 12 | - | - | 208 | 378 | 1407 |
| 13-50 | - | - | 208 | - | 1407 |

1/ Identifiable taxes and import tariffs are estimated to be about 20% of total cost (based on Mombasa Water Project).

2/ Part of cost of trunk and reticulation sewers which are recovered.

3/ Revenue is based on projected water sold to customers connected to the sewerage system, limited by the treatment capacity. Rate used in the calculations is KShs 0.77/m3.

KENYA

APPRAISAL OF A SITE AND SERVICE PROJECT

Nairobi Sewerage Program

Costs and Benefits - KE000's
(January 1974 prices)
(First Stage Only)

| Year | Costs | | | Benefits | |
|---|---|---|---|---|---|
| | Capital[1] | | O. & M. | Costs Recovered from | Sewerage Revenue |
| | Local | Foreign | (Incremental) | Plot Holders[2] | (Incremental)3 |
| 1 | 128 | 101 | - | - | - |
| 2 | 286 | 190 | 31 | - | 53 |
| 3 | 552 | 440 | 43 | 116 | 101 |
| 4 | 972 | 775 | 49 | 90 | 101 |
| 5 | 579 | 462 | 75 | 375 | 101 |
| 6 | 262 | 209 | 99 | 479 | 444 |
| 7 | 18 | 14 | 103 | 81 | 444 |
| 8 | - | - | 134 | 490 | 779 |
| 9 to 50 | - | - | 134 | - | 779 |

1/ Identifiable taxes and import tariffs are estimated to be about 20% of total cost (based on Mombasa Water Project).

2/ Part of cost of trunk and reticulation sewers which are recovered.

3/ Revenue is based on projected water sold to customers connected to the sewerage system, limited by the treatment capacity. Rate used in the calculations is KShs 0.77/$m^3$.

KENYA

APPRAISAL OF A SITE AND SERVICE PROJECT

Off-Site Sewerage Works Included In Site and Service Project

Capital Expenditure Schedule (KE000's)

| | 1975 | 1976 | 1977 | 1978 | 1979 | Total |
|---|---|---|---|---|---|---|
| Temporary waste stabilization pond | 12 | - | - | - | - | 12 |
| Service trunk sewers from site to main trunk sewer | 41 | 12 | 114 | - | - | 167 |
| Main trunk sewer to Site D (approximately 14.5 km) | - | 147 | 742 | 385 | 42 | 1316 |
| Sewage treatment works at Site D (30,000 $m^3$/day) | - | 53 | 321 | 138 | 15 | 527 |
| Land | 71 | - | - | - | - | 71 |
| Consulting services | 66 | 73 | 50 | 32 | 4 | 225 |
| Sub-total | 190 | 285 | 1227 | 555 | 61 | 2318 |
| Provision for physical contingencies | 8 | 31 | 177 | 77 | 9 | 302 |
| Total cost of work (at January 1975 prices) | 198 | 316 | 1404 | 632 | 70 | 2620 |
| Provision for price increases | 15 | 68 | 512 | 340 | 48 | 983 |
| Total cost of work (at escalated prices) | 213 | 384 | 1916 | 972 | 118 | 3603 |

KENYA

APPRAISAL OF A SITE AND SERVICES PROJECT

Community Facilities

Primary Schools

1. The project includes funding for 6 schools, on the assumption that the project area should be serviced to the same extent as the rest of the city, i.e., a 75% enrollment ratio. The primary schools will run by City Council's Education Department and provide seven years of basic education starting at the age of six years; each three-stream school can accommodate between 850 and 945 students. Free primary education for the first four years was begun in 1974, and the primary schools are heavily subsidized; each school has estimated annual operating expenses of K£31,200. The latter figure is indicative; NCC will be encouraged to keep these costs as low as possible.

Secondary Schools

2. It is government policy not to provide any more secondary schools in Nairobi until the imbalance between the greater number of places in the capital compared to the rest of the country has been reduced. Therefore, no provision has been made in the project for the construction of secondary schools. However, provision has been made for space in the layouts.

Health Centers

3. The project includes funds for two health centers, one of which will include a maternity wing. The existing standard for health centers in Nairobi is one for every 20,000 inhabitants, but shortage of staff in NCC Public Health Department allows for a provision of only one for 30,000 residents in Dandora. At health centers, first-aid and medicines will be given after examination by a medical assistant, nurse or doctor, more serious cases will be referred to hospital care or examinations. Mothers will attend ante-natal clinics, post-natal examinations, and infant,and toddlers' clinics at the center. The annual cost of running a health center, where services are free, is approximately K£40,000. There are currently seven maternity wings attached to health centers in Nairobi; Dandora is an appropriate location for an eight facility, which would serve residents from the surrounding area as well as the project. Maternity wings usually have 20 beds; deliveries are supervised by a registered midwife and Medical Officer. Running costs are roughly K£8,000 a year.

Multipurpose Community Centers

4. Two multipurpose community centers including day-care facilities will be constructed in the project area which is somewhat lower than the prevailing facilities/population ratio, but is appropriate since the anticipated density of the settlement will enable all residents to walk to the centers easily. The centers will be placed where people can meet to make decisions about local affairs, participate in organized entertainment and recreation, and receive training and support for the development of local crafts and small industries; they will also serve as a base for community development workers. The design of the centers will be simple and flexible so that they can be adopted to evolving uses. One center will be operated by the City Council's Social Services and Housing Department at an estimated annual cost of K£11,000. The other will be run by the National Christian Council of Kenya, which has had extensive experience in low-income urban neighborhoods in Nairobi and elsewhere in Kenya. The centers will also make space available to organizations such as the Maendeleo ya Wanawake (a crafts association for women) and the Red Cross so they can pursue their usual programs in Dandora.

5. The day-care facilities with 100 places each have been included in the multipurpose community centers. These will be run by the City Council's Public Health Department and cater to children between 2 1/2 and 6 years. Given the current fee structure, it costs the City Council approximately K£6,000 a year to operate such a facility. It is assumed that Dandora residents will also organize additional facilities on self-help basis, and space for 40 such centers has been reserved in the site layout.

Sports Complex

6. Provision has been made for one sports complex in the spine. There will be one small office and a number of playing fields and hard courts. Space will be reserved for the possible future development of other sports facilities. The complex will be used by the primary and secondary schools, and will be run by the Council's City Education Department at an approximate annual cost of K£9,000.

Markets

7. Space and funds for the construction of 402 market stalls of three different sizes (10, 15 and 20 m2) are included in the project, providing small-scale commercial facilities comparable to those elsewhere in the city. The markets will be the responsibility of NCC's Social Services and Housing Department. Stalls will be let on a commercial basis, and the markets should be self-financing or realize a small profit.

KENYA

APPRAISAL OF A SITE AND SERVICE PROJECT

Community Facilities: Standards and Operational Responsibilities and Costs

| Facility | Standards | Number of Facilities Provided in Project | Agency Responsible | Annual Operating Costs (K£) | | |
|---|---|---|---|---|---|---|
| Primary Schools | 1 3-stream school per 7,500 people; estimated population 1978/1979 approximately 45,000 | 6 | NCC City Education Department | 31,200 x 6 | = | 187,200 |
| Health Center | 1 per 30,000 people, a slight reduction of usual standards | 1 | NCC Public Health Department | 40,000 | = | 40,000 |
| Health Center with maternity wing. | The maternity wing in Dandora will be the 8th in Nairobi. | 1 | NCC Public Health Department | 40,000 | = | 40,000 |
| Multipurpose Community Centers | 1 per 30,000 people | 2 | NCC Social Services and Housing Department; National Christian Council of Kenya | 11,000 x 2 | = | 22,000 |
| With Day-Care Facilities | | | NCC Public Health Department | 6,000 x 2 | = | 12,000 |
| Sports Complex | 1 for project | 1 | NCC City Education Department | 9,000 | = | 9,000 |
| Markets | 9 $m^2$ per 100 people | 222 10 $m^2$ stalls<br>84 15 $m^2$ stalls<br>96 20 $m^2$ stalls | NCC Social | Self-financing | | |
| | | | | Total Annual Operating Costs | = | 310,200 |

ANNEX 7
Page 3
Table 1

KENYA

APPRAISAL OF A SITE AND SERVICE PROJECT

Lot Allocation and Building Materials Loans

## A. Lot Allocation Procedures

1. The Project Department will be responsible for allocating lots. Students from the University of Nairobi may assist during their long vacation to interview applicants and help them fill in the application forms. The students will undergo a brief orientation to familiarize them with the scheme, the application procedure, and techniques for soliciting information from the applicants.

2. The application forms will solicit information about the following characteristics of applicants:

(a) Income: Applicants monthly incomes must be less than KSh 650. The applicants will be required to provide some proof of income. For wage employees, a letter from their employer indicating the nature of the work, the monthly wage, and the length of employment will be required. For self-employed applicants, tax or business records would be sufficient. If these are unavailable, a letter from a social worker, local administrative officer, or minister indicating the type of work the applicant does and his approximate monthly income would be acceptable;

(b) Length of Residence in Nairobi: Only applicants who have been residing in Nairobi for at least two years will be eligible for lots;

(c) Resident Family: Only household heads whose families are living with them in Nairobi will be eligible.

(d) Other Property: Applicants may not own other residential property in Nairobi.

3. The application form may also request information about other socio-economic characteristics of the applicants. This information will not be used for the allocation process but will be stored for use in the evaluation of the scheme. Applicants will agree in writing to fulfill the requirements of the scheme if allocated a lot, especially that of living on the lot. The information collected from the application forms will be punched onto computer cards along with an identification number for each applicant. The actual selection of allottees will be done in two phases by the computer through a

random number program. The computer will also select waiting lists for the two types of lots; the lists will determine who will be allocated lots not taken up by the original allottees, lots taken over by the Department should the original allottees fail to fulfill their obligations, and lots sold to the Department by people who wish to move out of the project and give back their lots to the Department with full compensation for improvements.

4. In order to ensure public confidence in the allottee selection procedures and to insulate them from political pressures, each step in the process will be given as much publicity as possible. A list of certified applicants and their application numbers will be posted prior to the final selection and the names and numbers of the allottees and the people on the waiting list will be made public as soon as the selection process is completed.

5. Allottees will be required to pay a deposit of KSh550 including KSh150 for water and sewerage connection fees, between the announcement of allocations and the date they occupy their lots. The deposit will be counted as a credit against the allottee's outstanding loan principal after the allottee has completed his unit. The payment of a deposit will mean a tangible commitment by the allottee and will provide minimal security against which the initial materials loan payment can be made.

## B. Materials Loans Fund

6. The Project Department, through its Financial Division, will operate the materials loans scheme. Materials loans would be made in cash but each loan tranche would not exceed the security provided by the allottee's deposit against the mortgage (KSh400) plus the value of the materials in that portion of the house already constructed. Therefore, the initial materials loan payment cannot exceed the value of the deposit paid by the allottee. Each further installment cannot be greater than the sum of the deposit and the estimated value of the materials in the house, as certified by the technical staff. The technical supervisors will keep records of construction on each lot, and standard values for different phases of construction with different kinds of materials will be calculated. These values will be entered in the computerized accounting system so that the amount of materials loans for which an allottee is eligible can be determined easily at any time.

7. The maximum materials loan for Option A allottee will be KSh4,800, sufficient to build two rooms, and KSh2,400 for Option B allottees. Because of the flexibility of the computerized accounting system allottees will be allowed to borrow any amount of money up to the maximum. A typical schedule for the disbursement of materials loans for Option B would be as follows:

| Time Period | Amount of Loan | Value of Deposit Plus Materials in House |
|---|---|---|
| | (KSh) | (KSh) |
| $t_0$ | | 400 (deposit) |
| $t_1$ | 400 | 400 |
| $t_2$ | - | 800 |
| $t_3$ | 800 | 800 |
| $t_4$ | - | 1,600 |
| $t_5$ | 1,600 | 1,600 |

Option A households would draw their materials as outlined above up to a maximum of KSh 4,800.

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## Cost Recovery and Pricing

1. The 1974-1978 Development Plan states that all housing built by municipal authorities should be fully self-financing, but no guidance is given as to the definition of "self-financing", the means of cost recovery or the degree to which cross-subsidization should be utilized. At present there is no consistent policy on these questions within Government or the Nairobi City Council. Theoretically, of course, the most appealing solution would be to pass on housing at market prices and rentals. Any surplus which accrues may then be used to make corss-subsidies to individuals or to finance additional building. This principle has been introduced into the project by the proposed sale of 300 (5%) two-room units and 30 demonstration houses by auction with the surplus to be used to cross-subsidize Option A lot costs (see Table 2). Otherwise the policy has been adopted of pricing the majority of serviced lots on the basis of actual costs rather than what the market will bear in order to reach low-income households.

### Allocation of Costs

2. Since no standardized policy for housing charges exists within the NCC, a new system has been designed for the project. The intention is to provide a rational basis for allocation and recovery of costs which could be applied across all NCC's housing. The proposed formula attempts to ensure that all capital and recurrent costs specifically generated by the provision of shelter and services which are not recovered through existing user fees or rate structures will be recovered through direct payments by recipients of these items. Recipients include those departments of the city or government for whom plots for community facilities have been reserved. Thus, site preparation and servicing costs should be shared proportionately between NCC and households, as shown in the following table:

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Allocation of Costs

| CATEGORY | TOTAL COSTS (K£) | | | |
|---|---|---|---|---|
| | 1 | 2 | | 3 |
| | | Chargeable to NCC | | |
| | Total Cost | User Fees and Rates | Community Facilities /1 | Recovered From Lots |
| 1. SITE PREPARATION | 118,450 | 1,150 | 9,660 | 107,640 |
| a. Clearing and Grading | 37,950 | -- | 7,590 | 30,360 |
| b. Topo. and Soil Surveys | 10,350 | -- | 2,070 | 8,280 |
| c. Lot Demarcation | 69,000 | -- | -- | 69,000 |
| d. Fencing of Power Lines | 1,150 | 1,150 | -- | -- |
| 2. ON-SITE INFRASTRUCTURE | 1,071,340 | 474,225 | 65,595 | 531,520 |
| a. Primary Roads/Drainage | 397,095 | 277,965 | 23,830 | 95,300 |
| b. Secondary Roads/Drainage | 264,730 | -- | -- | 264,730 |
| c. Sewerage Reticulation | 158,355 | -- | 31,670 | 126,685 |
| d. Water Reticulation | 150,650 | 150,650 | -- | -- |
| e. Street Lighting | 65,780 | 19,735 | 9,210 | 36,835 |
| f. Landscaping | 11,500 | 11,500 | -- | -- |
| g. Refuse Collection | 23,230 | 14,375 | 885 | 7,970 |
| 3. COMMUNITY FACILITIES | 392,435 | 392,435 | -- | -- |
| 4. CORE UNITS | 1,528,200 | -- | -- | 1,528,200 |
| a. Wet Cores | 704,340 | -- | -- | 704,340 |
| b. One-Room Units | 622,800 | -- | -- | 622,800 |
| c. Two-Room Units | 179,100 | -- | -- | 179,100 |
| d. Demonstration Units | 21,960 | -- | -- | 21,960 /2 |
| 5. MATERIALS LOANS FUND | 1,144,800 | -- | -- | 1,144,800 |
| 6. TRUNK INFRASTRUCTURE | 2,163,150 | 2,163,150 | -- | -- |
| 7. TECHNICAL ASSISTANCE /3 | 766,950 | 664,830 | 45,865 | 56,255 |
| a. Project Unit | 348,000 | 348,000 /4 | -- | -- |
| b. Design and Engineering Fees | 375,950 | 273,830 | 45,865 | 56,255 |
| c. Housing Operations Study | 43,000 | 43,000 | -- | -- |
| | | | -- | -- |
| 8. PHYSICAL CONTINGENCIES (5-15%) | 587,010 | 383,390 | 30,690 | 172,930 |
| Sub-Total | 7,772,335 | 4,079,180 | 151,810 | 3,541,345 |
| TOTAL COSTS /5 | 7,772,335 | 4,230,990 | | 3,541,345 |

/1 Estimated at 20% of net land area.
/2 To be resold at market prices.
/3 Central Government will bear the costs of monitoring (K£36,000) and future project preparation (K£140,000).
/4 To be apportioned among beneficiaries at the completion of the NCC Housing Operations Study
/5 Excluding price contingencies.

3. Costs Recovered through User Fees and Rates: Utility tariffs, fees and property rates of NCC typically cover the costs of trunk infrastructure, community facilities, and technical assistance, and should cover certain types of on-site infrastructure, such as the cost of tarmacing primary roads used as bus routes (representing 70% of their cost), street lighting along those roads (30% based on linear mile of roadway), fencing of power lines, landscaping and additions to the city's fleet of refuse collection vehicles. All water reticulation is recovered by NCC through user fees. In addition, any on-site sewerage lines exceeding 9" in diameter would be paid for by Council.

4. Community Facilities: While costs attributable to community facilities will also be recovered through user fees and general revenues, such facilities constitute a class of "plot holder" (i.e. they occupy about 20% of total serviced area), and therefore share in certain basic costs which would otherwise be recovered only through lot sales prices. Thus for overall site clearing, grading and surveys, primary roads, sewerage reticulation, street and security lighting, and related design and engineering fees, these facilities will be allocated approximately 20% of total costs.

5. Costs Recovered from Lots: Capital costs to be recovered from allottees through monthly mortgage payments include site clearing, grading, surveys, and lot demarcation, about 25% of the costs of primary roads and all of secondary roads (since facilities are located within a central spine) including related street lighting, sewerage, refuse hard-standings, related design and engineering. Total costs of core units and materials loans will be recovered from participants. For reasons discussed in para. 5.03 of the main report, administrative costs will be recovered only when a clear rationale for apportioning such overheads has been worked out by the NCC Housing Operations Study.

Lot Development Costs

6. Site preparation and infrastructure costs attributable to plot-holders will be allocated on a square meter basis. Core unit costs are charged according to the level of amenity provided.

7. There are seven alternative cost options, based on three stages of lot development: Option A consists only of the serviced lot and built wet-core, available in three sizes (100 $m^2$, 120 $m^2$, and 140 $m^2$) and materials loans for two rooms. Option B, available in the same three sizes, will include one built room and materials loans for a second. The seventh option will be 300 two-room units plus wet-core.

8. Lot development costs (Table 2) include 15% physical contingencies on site preparation, on-site infrastructure and 5% on core units. None are included for building materials loans since amounts have been clearly specified.

Price contingencies have been omitted in order to facilitate comparision of monthly charges and current income on a 1975 basis. Interest during construction has been based on the average amount outstanding during the 12-month construction period (half of the total capital cost per lot) at 7.5% representing the average cost of NCC's borrowing for the project.

## Table 2: Lot Development Costs (K'000)

| Element | Total Recovered From Lots | OPTION A (3,900 Lots) Built Wet Core and Materials Loan: 100 m² Lot (1,232) | 120 m² Lot (1,436) | 140 m² Lot (1,232) | OPTION B (1,800 Lots) Built Wet Core & 1 Room plus Materials Loan: 100 m² Lot (569) | 120 m² Lot (662) | 140 m² Lot (569) | OPTION C (300 Lots) Built Wet Core and 2 Rooms: 160 m² Lot (300) |
|---|---|---|---|---|---|---|---|---|
| 1. SITE PREPARATION | 107,640 | 16.7 | 17.9 | 18.9 | 16.7 | 17.9 | 18.9 | 19.9 |
| Surveys | 8,280 | 1.1 | 1.4 | 1.6 | 1.1 | 1.4 | 1.6 | 1.8 |
| Demarcation | 69,000 | 11.5 | 11.5 | 11.5 | 11.5 | 11.5 | 11.5 | 11.5 |
| Clearing and Grading | 30,360 | 4.1 | 5.0 | 5.8 | 4.1 | 5.0 | 5.8 | 6.6 |
| 2. ON-SITE INFRASTRUCTURE | 531,520 | 72.6 | 87.1 | 101.5 | 72.6 | 87.1 | 101.5 | 116.1 |
| Roads and Surface Drainage | 360,030 | 49.2 | 59.0 | 68.8 | 49.2 | 59.0 | 68.8 | 78.7 |
| Sewerage Reticulation | 126,685 | 17.3 | 20.8 | 24.2 | 17.3 | 20.8 | 24.2 | 27.7 |
| Street Lighting | 36,835 | 5.0 | 6.0 | 7.0 | 5.0 | 6.0 | 7.0 | 8.0 |
| Refuse Hardstandings | 7,970 | 1.1 | 1.3 | 1.5 | 1.1 | 1.3 | 1.5 | 1.7 |
| 3. CORE UNITS | 1,528,200 | 182.0 | 182.0 | 182.0 | 346.0 | 346.0 | 346.0 | 597.0 |
| Built Wet Core (W.C. and Bath) | 704,340 | 182.0 | 182.0 | 182.0 | - | - | - | - |
| One-Room Unit | 622,500 | - | - | - | 346.0 | 346.0 | 346.0 | - |
| Two-Room Unit | 179,100 | - | - | - | - | - | - | 597.0 |
| Demonstration Units | 21,960/1 | - | - | - | - | - | - | - |
| 4. DESIGN AND ENGINEERING FEES /2 | 56,255 | 7.6 | 9.2 | 10.8 | 7.6 | 9.2 | 10.8 | 12.3 |
| 5. PHYSICAL CONTINGENCIES | 172,930 | 22.3 | 24.9 | 27.5 | 30.5 | 33.1 | 35.7 | 50.9 |
| 15% on Items 1 and 2 | 96,520 | 13.2 | 15.8 | 18.4 | 13.2 | 15.8 | 18.4 | 21.1 |
| 5% on Item 3 | 76,410 | 9.1 | 9.1 | 9.1 | 17.3 | 17.3 | 17.3 | 29.8 |
| 6. INTEREST DURING CONSTRUCTION /3 | 89,100 | 11.3 | 12.0 | 12.8 | 17.7 | 18.5 | 19.2 | 29.8 |
| Sub-Total Lot Preparation & Servicing | 2,485,645 | 312.5 | 333.1 | 353.5 | 491.1 | 511.8 | 532.1 | 826.0 |
| 7. CROSS-SUBSIDY | | - 55.1 | - 55.1 | - | - | - | - | +388.0 |
| Adjusted Lot Cost | | 257.4 | 278.0 | 353.5 | 491.1 | 511.8 | 532.1 | 1,214.0 |
| 8. MATERIALS LOANS (Optional) | 1,144,800 | | | | | | | |
| Option A | 928,800 | 240.0 | 240.0 | 240.0 | - | - | - | - |
| Option B | 216,000 | - | - | - | 120.0 | 120.0 | 120.0 | - |
| TOTAL | 3,630,445 | 497.4 | 518.0 | 593.5 | 611.1 | 631.8 | 652.1 | 1,214.0 |

/1 To be sold at market prices.

/2 Estimated at 10% of Items 1 and 2 for 5,300 lots.

/3 Estimated at 7.5% of the average amount outstanding over a 12-month construction period.

Cross-Subsidization

9. Option C lots and demonstration units will be sold at market prices and the surplus will be applied toward reducing the costs of Option A1 and A2, representing about half of the total number of lots developed under the project.

Monthly Charges

10. The monthly charges to households summarized in Table 3 are based on January 1975 figures, exclusive of price contingencies. They reflect the following terms to households:

11. Rate of Interest: The project's rate of interest of 8.5% is slightly below the current mortgage company lending rates presently prevailing in Kenya of about 9% but above that of NCC's tenant-purchase schemes at 7.5%. The project's rate represents a definite movement toward higher interest rates yet attempts to minimize the disparities between NCC terms for housing beneficiaries.

12. Downpayment/Maturity: A downpayment of KSh400 against lot development costs will be required of all participants. Two maturities are proposed of 20 and 30 years although allottees will be entitled to prepay loans if they wish. The longer repayment period will be applicable to Option A and the shorter to Option B, enabling the project to reach lower income groups than would otherwise be possible. The rationale underlying this adjustment is that the allottee under Option A must complete considerable building to reach to the same level of development as his counterpart under Option B. His borrowing requirements are therefore likely to exceed those of B. The longer amortization period therefore enables the participant under A to complete his home without undue sacrifice of other necessities.

13. Risk Reserve: A nominal provision for bad debts will cover any marginal losses in resales and financial and administrative costs of delinquencies and foreclosures. The appropriate provision for bad debts will be determined by the NCC Housing Operations Studies and a continuous review of this problem should result in periodic adjustments of perceived risks of each of the NCC's housing operations. A charge of 5% has been included under the terms of this project.

14. Building Materials Loans: Loans of about K£ 240 for Option A and K£ 120 for Option B will be available to participants on the same terms as their mortgage. A grace period of 5 years on building materials loans will be extended to allottees of Option A in order to encourage faster consolidation. The grace period will not apply, however, to occupants of Option B since they will have one-room core units from the very beginning and would be borrowing only one room's worth of building materials. The interest foregone during the grace period would be capitalized and the full amount repaid over 25 instead of 30 years. Monthly payments during the first five years and thereafter will therefore be as follows:

## Monthly Charges 1/

(K Shillings)

| Item | A (100 m2) | A (120 m2) | A (140 m2) | B (100 m2) | B (120 m2) | B (140 m2) |
|---|---|---|---|---|---|---|
| Total number of lots | 1,225 | 1,420 | 1,225 | 570 | 660 | 570 |
| Lot preparation, servicing and core units | 37 | 40 | 52 | 83 | 87 | 90 |
| Risk reserve (5%) | 2 | 2 | 3 | 4 | 4 | 5 |
| Land rent 2/ | 4 | 4 | 5 | 4 | 4 | 5 |
| Sub-total - Lot mortgage | 43 | 46 | 60 | 91 | 95 | 100 |
| Rates 3/ | 6 | 7 | 8 | 6 | 7 | 8 |
| Utilities 4/ | 24 | 24 | 24 | 24 | 24 | 24 |
| Sub-total - Mortgage plus utilities | 73 | 77 | 92 | 121 | 126 | 132 |
| Building materials loans | 0-54 | 0-54 | 0-54 | 0-21 | 0-21 | 0-21 |
| Total Range: | | | | | | |
| First five years 5/ | 73 | 77 | 92 | 121-142 | 127-147 | 132-153 |
| Thereafter | 73-127 | 77-131 | 92-146 | 121-142 | 127-147 | 132-153 |

1/ Including physical contingencies of 15% on infrastructure and 5% on buildings, design and engineering fees of 10% and interest during construction. Down-payments of KSh400 have been deducted from the principal of all lots, and a further KSh55 in crosssubsidies from the costs of about half the lots--all in Option A.

2/ Based on 3% of unimproved site value.

3/ Based on a 4.5% of unimproved site value.

4/ Based on tariffs effective January 1, 1975; utilities payments for project participants would be expected to rise in accordance with the overall tariff structure.

5/ During first five years Option A lot holders enjoy a grace period for the material loan.

15. Based on the above charges and assuming expenditure for shelter and services of roughly 25%, a monthly income of about KSh280 or K£14 would be required for the cheapest lot in Option A. A target income group of KSh280 to KSh500 has therefore been set for this option and a target of KSh450 - KSh650 for Option B. The monthly payments for Option A will experience a one-time jump after the five year material loan grace period. However, by that time the affected households should have a somewhat higher income and will have consolidated enough to allow at least one room for subletting. Extensive subletting now takes place in Nairobi's low-income housing areas with room rentals averaging between KSh100 - KSh150.

16. At 1974 estimated income levels, Option A lots constituting two-thirds of the project would be affordable by households as low as the 20th percentile in the income distribution curve. Option B lots constituting the remaining third of the project would be affordable to households in the second quartile in the income scale with most of the lots going to households between the 30th and 40th percentile.

Project Cash Flow

17. The expected flow of funds generated by the residential component 1/ (Annex 9) shows a cumulative surplus ranging from K£25,000 (US$70,000) to K£380,000 (US$1,064,000) during the first ten years of the project. The sale price of Option C units, estimated at K£1,200 is critical to the realization of this surplus. However, even if the profit on these units was reduced to half that expected, the cumulative account would experience only a small deficit in 1982 which would be eliminated by 1984.

18. The non-revenue producing project items (Annex 9, Table 4) comprising community facilities, technical assistance and maintenance of infrastructure will increase the projected deficit on NCC's general fund by about K£51,000 in 1976 rising to K£382,000 by 1980 (Annex 10, Tables 3 and 4). The precarious state of NCC's general revenue fund and the steps being undertaken by Government to deal with this situation have been discussed in paras 2.06 and a Government Working Party on Municipal Finances has recently completed its report. The Government is further requesting the assistance of the IMF in undertaking a more technical analysis of the recommendations formulated by the Working Party. Meanwhile the City Council and the Government are discussing specific measures to ensure NCC financial viability until the Working Party/IMF recommendations are implemented. The level at which Government should undertake to maintain NCC finances and the specific measures that it should employ in doing so were be discussed and agreed with

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1/ Excludes trunk infrastructure, community facilities and technical assistance. The costs of water and sewerage will be carried by NCC's Water and Sewerage Department whose charges are intended to yield a certain rate of return on assets (see Annex 6). The roads, community facilities and technical assistance are covered by property rates and Government subventions.

both NCC and Government at negotiations. It was also be agreed at that time that annual NCC accounts audited by an auditor acceptable to the Bank will be submitted to IBRD within 6 months of the end of each fiscal year for ten years after project completion.

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Cash Flow

NCC Residential Component 1/

| | 1975 | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1. Sources of Funds | | | | | | | | | | |
| IDA/IBRD Loan | 136,970 | 480,930 | 680,290 | 413,440 | 236,120 | | | | | |
| GOK | 112,060 | 393,495 | 556,600 | 338,260 | 193,180 | | | | | |
| Payments by Households: | | | | | | | | | | |
| Downpayment | | 18,900 | | 94,500 | | | | | | |
| Mortgage and Land Rent 2/ | | 17,625 | 35,250 | 123,380 | 211,505 | 211,505 | 211,505 | 211,505 | 211,505 | 211,505 |
| Materials Loans | | 1,890 | 3,780 | 13,230 | 22,680 | 22,680 | 43,580 | 43,580 | 148,070 | 148,070 |
| Sale of Units | | 66,770 | | 333,850 | | | | | | |
| TOTAL | 249,030 | 979,610 | 1,275,920 | 1,316,660 | 663,485 | 234,185 | 255,085 | 255,085 | 359,575 | 359,575 |
| 2. Uses of Funds | | | | | | | | | | |
| Design & Engineering | 50,630 | 5,625 | | | | | | | | |
| Site Preparation and Servicing | 70,000 | 250,400 | 276,790 | 128,490 | | | | | | |
| Core Units | 128,400 | 465,300 | 673,900 | 337,010 | | | | | | |
| Materials Loans | | 143,100 | 206,200 | 286,200 | 429,300 | | | | | |
| Land Rent | | 1,530 | 3,065 | 10,730 | 18,395 | 18,395 | 18,395 | 18,395 | 18,395 | 18,395 |
| Amortization of Debt: | | | | | | | | | | |
| IDA/IBRD 3/ | | 11,640 | 52,520 | 110,350 | 145,490 | 199,370 | 199,370 | 199,370 | 199,370 | 199,370 |
| GOK 4/ | | 8,510 | 38,400 | 80,680 | 106,370 | 121,050 | 121,050 | 121,050 | 121,050 | 121,050 |
| TOTAL | 249,030 | 896,105 | 1,330,875 | 953,460 | 699,555 | 338,815 | 338,815 | 338,815 | 338,815 | 338,815 |
| Annual Surplus/Deficit | — | 83,505 | -54,955 | 363,200 | -36,070 | -104,630 | -83,730 | -83,730 | 20,760 | 20,760 |
| Cumulative Surplus/ Deficit | — | 83,505 | 28,550 | 391,750 | 355,680 | 251,050 | 167,320 | 83,590 | 104,350 | 125,110 |

1/ The cash flow deals with only that portion of total project costs to be recovered from lot holders (see Annex 9, Table 1). Sources and uses include physical contingencies but not price escalation.

2/ Assuming 5% default; terms of 8.5%, 20 and 30 years for Option B and A respectively.

3/ 8.5% over 25 years including a 4 year grace period.

4/ 6.5% over 25 years; no grace period.

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Cash Flow 1/

Project Components Affecting General Fund
(K£)

| | 1975 | 1976 | 1977 | 1978 | 1979 | 1980 |
|---|---|---|---|---|---|---|
| SOURCES OF FUNDS | | | | | | |
| IDA/IBRD/GOK Loans | 273,120 | 547,740 | 709,540 | 377,420 | 171,850 | |
| GOK Grants 2/ | | 17,000 | 52,300 | 85,200 | 121,680 | 121,680 |
| Lot Occupants Property Rates 3/ | | 2,100 | 4,200 | 14,700 | 25,200 | 25,200 |
| TOTAL SOURCES | 273,120 | 566,840 | 766,040 | 477,320 | 318,730 | 146,880 |
| USES OF FUNDS | | | | | | |
| Construction: | | | | | | |
| Site preparation | 2,570 | 10,150 | 2,420 | | | |
| On-site infrastructure | 47,650 | 172,730 | 250,180 | 125,080 | | |
| Community facilities | | 85,930 | 178,000 | 178,000 | 171,850 | |
| Access roads | | 56,030 | 56,040 | | | |
| Technical assistance | 222,900 | 222,900 | 222,900 | 74,340 | | |
| Amortization of Debt | | | | | | |
| IDA/IBRD/GOK 4/ | | 24,520 | 73,680 | 137,370 | 171,250 | 186,670 |
| Recurrent Expenditures: | | | | | | |
| Community facilities | | 43,400 | 124,000 | 217,140 | 310,200 | 310,200 |
| Maintenance on roads and on-site infrastructure 5/ | | 2,350 | 12,140 | 23,800 | 28,870 | 28,870 |
| TOTAL USES | 273,120 | 618,010 | 919,360 | 755,730 | 682,170 | 525,740 |
| ANNUAL SURPLUS/DEFICIT | -- | -51,170 | -153,320 | -278,410 | -363,440 | -378,860 |
| CUMULATIVE SURPLUS/DIFICIT | -- | -51,170 | -204,490 | -482,900 | -846,340 | -1,225,200 |

1/ Sources and uses include physical and price contingencies.

2/ Covering teachers' salaries estimated at 65% of recurrent educational expenditures.

3/ Approximately Sh7 per household per month.

4/ Average terms of IDA/IBRD/GOK loans estimated at 7.6% over 25 years, no grace.

5/ 2% of value of both residential and NCC infrastructure excluding water and sewerage.

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## Municipal Finances

### A. General

1. Until 1968 local authorities accounted for 20% of public sector expenditures. Although revenues raised by local authorities have never entirely covered these expenditures, they were also responsible for a very substantial portion of the total Kenya tax effort. At Independence, about 21% of total revenues accrued to local authorities; this figure declined to about 18% in 1968 (when the local authorities were reorganized, see below) and to about 12% by 1973.

2. Government policy with respect to local government financing is not well defined. At Independence an essentially British system and division of responsibility between the center and the local authorities was inherited and continued. An important innovation, however, was that local authorities were given an independent power of income taxation through an instrument known as the Graduated Personal Tax (GPT). This tax provided a sound fiscal base and permitted, the urban areas at least, to carry out their considerable responsibilities without subvention from central government resources. There are two categories of local authorities: municipal or urban councils (11) and county or rural councils (38). The County Councils were predominantly responsible for the deterioration in overall local government finances up to 1968. Between 1966 and 1968 their recurrent expenditures increased dramatically and recurrent deficits doubled in these two years. In 1968, about 50% of these deficits were financed through overdrafts and drawing down of reserves, and the remainder through government grants. 1/

3. Government decided in 1968 to require the Municipal Councils to remit to the rural areas any Graduated Personal Tax (GPT) collected in respect of incomes earned by people domiciled in the rural areas. This amounted to a transfer of about 30% of collections in 1968 rising to about 50% in 1973. The provision was both inadequate to restore budgetary equilibrium to the County Councils and placed a significantly increased burden on the municipalities. Therefore beginning in 1970 the Government decided to take over the major expenditure and revenue functions of the County Councils: education, health, and road maintenance, accounting for about 80% of their

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1/ If these were to be fully met from the Central Government about 8% of Government revenue would have been absorbed. A full account of the development of Local Government Finances in Kenya since Independence is given in the Basic Economic Report on Kenya--Vol. 2, IBRD Report No. 201KE.

total expenditure became Government's responsibility. At the same time their rights to levy GPT, charge school fees and to receive road maintenance grants were rescinded. The Government continued to demand the GPT transfer from municipalities until 1973.

## B. Situation of Municipal Councils

4. The Municipal Councils, unlike County Councils, are operating in the richest parts of the economy and although they have never relied to any great extent on government grants they have also never been able to save very much: almost all their capital expenditures are financed by borrowing. Of course, the transfer of some GPT since 1968 and the government grants-in-aid to the County Councils have implied some measure of regional redistribution of revenue but in view of the very favorable rural-urban terms of trade to the municipalities, there is some justification in the Government's apparent dissatisfaction with the revenue efforts of the municipalities.

5. On the other hand, the municipalities have wide ranging and important expenditures functions, which have remained unchanged since Independence. Their responsibilities and powers are laid down by the Local Government Regulations (1963), as amended from time to time, and include: housing, primary education, health centers, urban road maintenance and construction, water and sewerage, markets, fire services, public libraries, and welfare services and sundry other public works. At present, the municipalities have only a very limited command over the resources required to finance these very important public services. Until 1973, Municipal Councils could levey property taxes, Graduated Personal Tax, various license fees, fees for education and user fees on water and sewerage, parking fees and other sundry income. GPT and property taxes represented over 50% of all current revenue. User charges and fees account for the other half of current income and loans account for all development expenditure. Thus, although the Municipal Councils have been unsuccessful in generating any internal surplus they have until recently been quite successful at operating without substantial deficits, and this remained more or less true even while they were required to make substantial contributions to rural areas through the GPT transfer.

6. It is thus hard to find a convincing rationale for the present government policies towards Municipal Councils which is exemplified by the abolition of GPT in 1973 and the subsequent mutilation of local finances. GPT was a type of local income tax, in fact a combination of a pool tax and income tax, that was not progressive and beyond income of K£600 per month was regressive. The administrative costs of the tax were high and evasion in rural areas was high. Thus it is clear that GPT was not an ideal tax and therefore its reform and strengthening would have been welcomed. In 1973, however, as part of the fiscal reforms of the budget of that year, the GPT

was abolished. In its place Government introduced a general sales tax accruing directly to Government but did not at the same time reduce either the current or development expenditure functions of the municipalities, or specify any alternative sources for local government revenues.

7. Government policy implies that by removing independent sources of taxation, except rates, and by leaving functions unaltered the municipal authorities will be forced into greater tax efforts and at the same time the Central Government will itself benefit from the additional sales tax revenue. To achieve this, Government has proposed that the Municipal Councils should receive grants in lieu of GPT on a declining basis.

8. Table 1 shows the main sources of municipal income since 1964. The effects of Government action on GPT revenues can be clearly seen. From 1968 to 1971, for example, municipalities had to transfer part of GPT to rural areas which by 1971 accounted for 50% of GPT revenue. By 1973, GPT again accounted for 25% of total incomes, including loans raised, and its abolition therefore puts considerable strain on local finances. Property taxes have been a declining proportion of total revenue, as have user fees, but these two sources now represent the only ones which can be exploited in the short term. Taken together, therefore, the municipal income sources are neither flexible nor buoyant. Furthermore, the Councils have no automatic access to loan funds or short term money. The elasticity of local government revenues with respect to monetary GDP is another cause for concern. The IBRD basic economic report found this to be extremely small: the elasticity of direct taxes of municipal and county councils is .008 (Monetary GDP) and other revenues about .009. Without GPT these figures may be expected to be even lower.

9. The current Development Plan (1974-1978) provides the best indication of Government's intentions towards local governments. The only element of revenue sharing envisaged is the declining GPT grant. This is set at a total of K₤10 million for the next four years representing a net loss (compared to what GPT revenue would have been) of about another K₤10 million. Although many services are designated in the Plan to be self-financing, no revision in government approvals for increased pricing is indicated. This is exacerbated by policy changes such as the abolition of school fees. The capital program side of the Plan is perhaps even less encouraging. In circumstances where their most buoyant source of revenue has been abolished, Municipal Councils are expected to generate from internal funds K₤10 million over the period, or about K₤2.5 million a year. This is a figure never approached previously and is even larger than the planned figure for stock issues (K₤8 million).

## C. NCC Financial Condition

10. The problems outlined above are most apparent in Nairobi, which is by far the largest municipal authority and accounts for well over half of total municipal revenues and expenditures. A detailed analysis of NCC's financial condition supports the conclusion that by 1976 NCC will move into overall deficit.

11. General Fund Account. The aggregate General Fund expenditures together with the main sources of income are shown in Table 2. The proportion of current costs met by user charges has fallen from 60% in 1961 to a current level of about 32%; thus a greater amount has to be met from general revenues such as property taxes. Graduated Personal Tax, introduced in 1964, was abolished on December 31, 1973 and the Government currently makes a transitional contribution in lieu of GPT.

12. Graduated Personal Tax quickly developed into the major source of revenue and continued to grow by about 10% a year. Property tax income, which has grown by about 6.5% p.a. over the period to 1973, is based on unimproved site values and has not proved to be so buoyant. The implied tax rate on property is presently far below world-wide averages and both the rate of taxation and the value of the base will need to be increased in the longer term. Differential rating operates only to the extent that it recognizes urban and rural development.

13. Table 3 shows a projected deficit for the General Fund at current service levels. The table speaks for itself and the very precarious nature of NCC's financial position does not need any emphasis. Without supplementary government action, total reserves on the General Fund will have been exhausted by early 1977. Accumulated annual deficits will then require deficit financing if services are to be maintained and remedial action will require either increases in user charges, which might be regressive, or interim support from Central Government until long-term viability can be established.

14. The Capital Program. Nairobi City Council is required by legislation governing local government procedures to prepare capital budgets. Until 1972, this involved compilation of five-year programs which, being demand oriented compared relative priorities during the plan period. A capital budget provides a two-fold purpose: first it is a policy statement concerning future development, and second it is a device for budgetary control especially when exemplified in multi-year budgets which superimpose the effect of capital development on current needs and resources.

15. It has not been the practice in Nairobi to prepare multi-year revenue budgets and indeed the competence of capital budgeting may be judged by the fact that actual expenditure consistently fell well short of estimates. Because of central government anxieties over the availability of loan finance which could economically be raised, a moratorium was applied, in 1973, to

capital schemes and in effect only work-in-progress was allowed to continue. Capital budgets continue to be prepared by activity and are determined by the expected availability of loan finance and budgets currently set out for each scheme. Approval for expenditure on each scheme depends on sanction by the appropriate Government Department for raising loans. Since the abolition of GPT, the financial structure of Nairobi City Council produces little scope for capital finances other than by loan, although Nairobi is being encouraged in the plan to provide K£6 million from revenue contributions to capital outlay by 1980.

16. It is clear from the above sections that Local Government finances in Kenya need a thorough review. It is equally clear that Nairobi City Council's financial position will require remedial action both in the short and long-term solutions. It is expected that the study will, inter alia, examine the allocation of responsibilities between Central and Local Governments, intergovernmental relations including revenue sharing, and the scope for new sources of revenue that Local Governments might tap.

KENYA

APPRAISAL OF A SITE AND SERVICE PROJECT

Table 1. Source of Income of Municipal Councils 1967-1973 1/

Thousand of Kenya Pounds

| | 1967 | 1968 | 1969 | 1970 | 1971 | 1972 | 1973** |
|---|---|---|---|---|---|---|---|
| Graduated Personal Tax | 2,688 | 1,915 | 2,046 | 2,297 | 4,723 | 4,104 | 4,286 |
| Indirect Taxes (Licences, Cesses and Rates) | 2,263 | 2,464 | 3,191 | 3,298 | 3,850 | 377 | 4,116 |
| Income from Property (Buildings and Land Rents) | 1,139 | 1,272 | 1,390 | 1,484 | 1,780 | 1,865 | 2,068 |
| Interest on Investments | 350 | 167 | 429 | 225 | 226 | 104 | 324 |
| Sale of Goods and Services: | | | | | | | |
| School fees | 453 | 526 | 497 | 517 | 525 | 616 | 711 |
| Sale of water | 1,060 | 1,065 | 1,124 | 1,303 | 2,235 | 1,621 | 1,986 |
| Sale of beer | 350 | 474 | 391 | 363 | 354 | 348 | 216 |
| Markets and slaughter charges | 58 | 72 | 46 | 50 | 131 | 78 | 90 |
| Sewerage and refuse removal charges | 715 | 869 | 460 | 995 | 569 | 1,198 | 1,170 |
| Other sales | 598 | 622 | 620 | 740 | 677 | 597 | 661 |
| | 211 | 286 | 255 | 116 | 186 | 40 | 95 |
| Government Grants | 211 | 286 | 255 | 116 | 186 | 40 | 95 |
| Loans Raised | 1,356 | 2,003 | 2,157 | 1,534 | 3,081 | 5,681 | 3,179 |
| Miscellaneous (including court fines, sale of capital assets, loan repayment, Government grants and non Government grants) | 132 | 91 | 347 | 392 | 166 | 451 | 548 |
| TOTAL | 11,373 | 11,826 | 12,953 | 13,315 | 12,588 | 20,480 | 19,450 |

1/ Nairobi accounts for rather over 50% of total municipal finances.

** Provisional

SOURCE: Statistical Abstracts and Economic Survey, 1974

## General Fund Account - Analysis

| | 1970 KŁ 000 Actual | 1971 KŁ 000 Actual | 1972 KŁ 000 Actual | 1973 KŁ 000 Revised Estimates | 1974 KŁ 000 Estimates |
|---|---|---|---|---|---|
| **Gross Expenditures** | | | | | |
| General Administration | 376 | 360 | 639 | 473 | 577 |
| General Charges | 74 | 141 | 95 | 109 | 165 |
| Public Health | 1,462 | 1,637 | 2,166 | 2,718 | 3,212 |
| Education | 1,443 | 1,657 | 1,978 | 2,165 | 2,637 |
| Public Works and Services | 1,340 | 1,027 | 1,090 | 1,381 | 1,322 |
| Parks, Grounds and Sundry Properties | 134 | 163 | 163 | 258 | 250 |
| Housing | 916 | 914 | 1,147 | 1,127 | 1,266 |
| Social, Training and Recreational Facilities | 322 | 335 | 463 | 537 | 590 |
| | 6.067 | 6,234 | 7,741 | 8,768 | 10,019 |
| **Add:** | | | | | |
| Revenue Contributions to Capital Outlay | 100 | 500 | 230 | -- | 20 |
| Training | 82 | 109 | 114 | 136 | 138 |
| Provisional Sums | 100 | -- | -- | -- | -- |
| Contingencies | -- | 100 | -- | -- | -- |
| Contributions to Capital Fund | -- | 1,210 | -- | -- | -- |
| Provision for Bad Debts | 30 | 30 | -- | -- | -- |
| | 6,379 | 8,183 | 8,085 | 8,904 | 10,177 |
| **Less:** | | | | | |
| Service Charges | | | | | |
| - central administration | 164 | 195 | 201 | 188 | 200 |
| - general charges | 8 | 11 | 7 | 7 | 7 |
| - public health | 381 | 412 | 424 | 798 | 882 |
| - education | 395 | 423 | 452 | 498 | |
| - public works and services | 732 | 175 | 180 | 285 | 287 |
| - parks, grounds, and sundry properties | 19 | 39 | 34 | 108 | 100 |
| - housing | 871 | 898 | 927 | 1,096 | 1,525 |
| - social, training and recreational facilities | 162 | 160 | 162 | 224 | 261 |
| | 2,732 | 2,313 | 2,387 | 3,204 | 3,262 |
| General Income | | | | | |
| - property tax | 2,125 | 2,539 | 2,530 | 2,560 | 3,242 |
| - GPT | 1,570 | 3,627 | 2,572 | 3,210 | -- |
| - government grants | -- | -- | -- | -- | 2,700 |
| - other | 119 | 126 | 155 | 180 | 80 |
| | 6,546 | 8,605 | 7,644 | 9,154 | 9,284 |
| **General Fund** | | | | | |
| Annual Surplus | 167 | 422 | -- | 250 | -- |
| Annual Deficit | -- | -- | 441 | -- | 893 1/ |

1/ Without recent pooled housing rent increases the deficit in 1974 would amount to KŁ1,370,000.

SOURCE: NCC Abstract of Accounts and Estimates.

KENYA

APPRAISAL OF A SITE AND SERVICE PROJECT

Cash Flow - General Fund Services

Analysis and Projection (Without IBRD Project)

| | 1970 | 1971 | 1972 | 1973 | 1974 | 1975 | 1976 | 1977 | 1978 | 1979 | 1980 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | K£ m | K£ m | K£ m | K£ m | K£ m | K£ m | K£ m | K£ m | K£ m | K£ m | K£ m |
| **BALANCE BROUGHT FORWARD** | | | | | | | | | | | |
| Surplus | 2.78 | 5.44 | 3.95 | 1.81 | 4.19 | 3.30 | 1.67 | -- | -- | -- | -- |
| Deficit | -- | -- | -- | -- | -- | -- | -- | 0.95 | 4.52 | 9.1 | 14.36 |
| **SOURCES** | | | | | | | | | | | |
| Taxes | | | | | | | | | | | |
| - Property /1 | 2.13 | 2.54 | 2.53 | 2.56 | 3.24 | 3.45 | 3.67 | 3.91 | 4.16 | 4.43 | 4.72 |
| - GPT | 1.57 | 3.62 | 2.57 | 3.21 | -- | -- | -- | -- | -- | -- | -- |
| Government Revenue | | | | | | | | | | | |
| - subvention grant | -- | -- | -- | -- | 2.70 | 2.28 | 1.62 | 0.98 | 0.32 | -- | -- |
| Fees and Charges /2 | 2.73 | 2.31 | 2.38 | 3.20 | 3.26 | 3.48 | 3.73 | 3.09 | 4.27 | 4.57 | 4.09 |
| Interest | 0.12 | 0.13 | 0.15 | 0.18 | 0.08 | 0.04 | -- | -- | -- | -- | -- |
| Adjustments in balances | 0.20 | 0.37 | -- | 2.00 | -- | -- | -- | -- | -- | -- | -- |
| Investment profit | 0.19 | (0.22) | 0.45 | -- | -- | -- | -- | -- | -- | -- | -- |
| Loan Income /3 | 2.41 | 1.33 | 1.41 | -- | -- | -- | -- | -- | -- | -- | -- |
| Miscellaneous Grants | 0.07 | 0.08 | 0.10 | -- | -- | -- | -- | -- | -- | -- | -- |
| Capital receipts | 0.32 | 0.16 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 9.74 | 10.32 | 9.59 | 11.15 | 9.28 | 9.25 | 9.02 | 8.88 | 8.75 | 9.0 | 9.44 |
| **APPLICATIONS** | | | | | | | | | | | |
| Recurrent expenses /4 | 6.07 | 6.23 | 7.74 | 8.77 | 10.17 | 10.88 | 11.64 | 12.45 | 13.33 | 14.26 | 15.25 |
| Adjustments to balances | -- | -- | 3.27 | -- | -- | -- | -- | -- | -- | -- | -- |
| Capital expenditures | 1.01 | 5.58 | 0.72 | -- | -- | -- | -- | -- | -- | -- | -- |
| | 7.08 | 11.81 | 11.73 | 8.77 | 10.17 | 10.88 | 11.64 | 12.45 | 13.33 | 14.26 | 15.25 |
| **BALANCE CARRIED FORWARD** | | | | | | | | | | | |
| Surplus | 5.44 | 3.95 | 1.81 | 4.19 | 3.30 | 1.67 | -- | -- | -- | -- | -- |
| Deficit | -- | -- | -- | -- | -- | -- | .95 | 4.52 | 9.1 | 14.36 | 20.17 |

NOTE

1. Natural growth in property tax rate 6.25%. Fees and charges adjusted for free education from 1974. Figures after 1974 are at 1974 prices.
2. Service fees and Recurrent Expenses assumed real rate of growth at 7%, the expected growth rate of GDP.
3. No information is a vailable for capital expenditures for 1973 onwards and the above assumes no continuing capital program. USAID loan currently being negotiated is not included.
4. Recurrent expenses include debt servicing on existing loans.

KENYA

APPRAISAL OF A SITE AND SERVICE PROJECT

Comprehensive NCC Cash Flow
(Cumulative - With the Project)
(K£'000)

| | | 1974 | 1975 | 1976 | 1977 | 1978 | 1979 | 1980 |
|---|---|---|---|---|---|---|---|---|
| I. | NCC ANNUAL SURPLUS/DEFICIT WITHOUT THE PROJECT 1/ | 3,300 | -1,630 | -2,620 | -3,570 | -4,580 | -5,260 | -5,810 |
| II. | IBRD SITE AND SERVICE PROJECT ANNUAL SURPLUS/DEFICIT | | | | | | | |
| | A. Residential Component (mortgages) 2/ | - | - | 83 | -55 | 363 | -36 | -105 |
| | B. Project Components affecting General Fund (Community Facilities, Technical Assistance, etc.) 3/ | - | - | -51 | -153 | -278 | -363 | -379 |
| | TOTAL ANNUAL SURPLUS/DEFICIT | 3,300 | -1,630 | -2,588 | -3,778 | -4,495 | -5,659 | -6,294 |
| | TOTAL CUMULATIVE SURPLUS/ DEFICIT | 3,300 | 1,670 | -918 | -4,696 | -9,191 | -14,850 | -21,144 |

1/ Annex 10, Table 3; assuming no capital program

2/ Annex 9, Table 3

3/ Annex 9, Table 4

# DANDORA COMMUNITY DEVELOPMENT PROJECT

# STUDY OF NAIROBI CITY COUNCIL HOUSING OPERATIONS

# BRIEF FOR CONSULTANT

## I. BACKGROUND

The Nairobi City Council has recently completed a study of the City's past and future growth and of its principal problems. The study defined a general growth strategy for the city, focusing primarily on the areas of employment, transportation, and housing. Regarding housing, the study confirmed that construction of new dwellings has been both inadequate in number and of high cost, resulting in a growing squatter population, over-crowding and a rapid increase in unapproved dwellings. The low level of public sector output is a reflection partly of the rapidity of urban growth and limited resources, and partly of a relatively cumbersome and inefficient City Council housing and services delivery system. The Urban Study, in recognition of this, recommended the establishment of a Housing Agency within the City Council's structure. The Kenya Government, in its review of the Urban Study, has supported this recommendation and the Ministry of Housing and Social Services has prepared an outline for such an Agency (Appendix 1).

The Dandora Community Development Project, a site and services scheme being executed with World Bank assistance, will make a substantial contribution to Nairobi's low-cost housing stock. Because of the deficiencies of the City Council's current administrative arrangements for housing projects, a special Department has been established within the Council for the implementation of this project. Meanwhile, the present Study will be carried out to define the tasks of the proposed Housing Agency and how it will operate. The Study will propose a schedule for the establishment of the Agency and when and how the Dandora Project Department can be merged with the Agency.

## II. OBJECTIVES

The principal objective of setting up a strong, unified Housing Agency is to enhance the institutional capacity of the Nairobi City Council to program, plan, implement, and manage housing projects and related community facilities quickly and efficiently. The Agency's attainment of this objective will depend on improvements in four aspects of the housing operations within Nairobi which will be the main focuses of the Consultants' study and recommendations. Firstly, the adminsitrative structures for housing should be reorganized to provide strong executive direction in the housing field, to facilitate coordination of the activities necessary for the planning and

implementation of projects, and to make the best use of staff and other resources. Secondly, procedures which ensure a fair allocation amongst the population for which a project is intended. Thirdly, new techniques of financial management are necessary to ensure the financial viability of the Council's housing operations and to provide the information required for sound management and pricing policies. Finally, the procedures by which councillors review and thus guide housing operations need to be revised to improve the policy guidance to officers in this field, to reduce the time devoted by both groups to committee meetings.

## III. SCOPE OF STUDY

The Study shall be concerned primarily with the housing (including related services) operations of the Nairobi City Council. The Consultants shall be solely responsible for the conclusions and recommendations contained in their report.

The Study shall cover the following:

(a) an analysis of existing housing operations, private and public (planning, execution, management, financial policies including rents);

(b) analysis of NCC's procedures for collection of rents and the financial condition of housing accounts;

(c) on the basis of (a) and (b) above and the proposal in Appendix 1 formulate alternative operating and management procedures for the proposed Agency and administrative arrangements for programing, planning, funding, implementation and management of housing projects;

(d) a recommended system together with an action program for its implementation; and

(e) a recommendation of how the Dandora Project Department may integrate into the system.

1. Analysis of Existing Housing Operations. The Consultants shall review the existing housing operations private and public, in Nairobi to establish the current status and practices. With the Council's Housing Operations, the review shall analyze at least the following:

(a) the Council's housing stock, by date of construction of each scheme, cost per unit, present rents;

(b) the method used in calculating rents and the historical profile of rent increases over the past ten years;

(c) the method used in collecting rents and the process of dealing with rent defaulters;

(d) the housing financial account over the past ten years with particular reference to the accounting system used, sources of financial shortfalls etc., and the maintenance process;

(e) the ways in which the Council's housing policies have been conceived and implemented;

(f) the process by which housing schemes and infrastructural services are currently programed, planned, financed, executed and allocated, paying attention to the decision making role of the Central Government, the National Housing Corporation, the Council Committees and the City's staff on target population, standards etc.;

(g) the process by and stage at which related facilities (schools, community centers etc.) are brought into the planning of housing schemes. Consultants should pay particular attention to coordination problems between agencies and department/ sections responsible for such facilities and the Department of Social Services and Housing; and

(h) the size and staffing (quantity and quality) of the Departments presently involved in housing, their structural relationship with other Departments and Council Committees and their role in project inception, programing, planning and execution.

From the above analysis, the Consultant shall identify the principal problems and bottlenecks in inception, execution and management of housing projects in the Council.

2. Alternative Arrangements for Planning, Funding, Implementation, and Managing Housing Operations

(a) The Consultants shall, based on the foregoing review and their study of the proposed Housing Agency (Appendix 1) formulate alternative arrangements for overcoming the problems and bottlenecks identified above;

(i) in formulating these alternatives the Consultants shall identify ways of streamlining and strengthening the process, policy, inception, programing, planning implementation, allocation and management for housing projects as well as sensitizing it to the needs of low-income groups. Special attention should be given to the procedure by which the City Council draws up its overall capital and recurrent program and the

proportion thereof devoted to housing. The scope of the Council's future housing activities shall be identified;

(ii) the Consultants shall identify the preferred alternative.

(b) The Consultants shall outline operating procedures for the new Agency, covering relationships with other Departments, Sections (including possible amalgamations if appropriate), and Council Committees in order to increase overall efficiency and ensure timely provision of related facilities such as schools, public health facilities etc., in numbers in compliance with Council's and Government policies;

(c) The Consultants should recommend ways in which Council Committees' review of housing projects and operations can be simplified and focused on providing policy guidance. The Consultants should also recommend fair and objective ways of allocating housing including a critical examination of allocation by computer;

(d) Based on their review of existing housing accounts and rent calculation, the consultants shall suggest modifications to Council's current accounting system and budgetary procedures for housing to permit closer control of expenditure, to provide better information to executive officers about the financial status of housing operations, to aid in the reduction of arrears, and to allow more accurate calculation of the full costs of Council housing projects. In this respect consultants shall pay particular attention to pricing of facilities in housing schemes and recommend pricing policies which will make Council's housing operations substantially self-financing and therefore replicable.

3. Program for Implementation of Recommendations. The Consultants shall prepare a detailed schedule indicating how their recommendations can be implemented with the least disruption to the Council's housing and other programs and which reallocation of staff is required. They should clearly state the priority of the changes and which changes are interdependent. Close recognition should be paid to the fact that all reforms will be seen as areas of discussion between the World Bank and the Nairobi City Council and cannot be implemented without mutual consent.

4. Schedule of Merger. The schedule should include a detailed outline of how the Dandora Project Department staff will be phased into the Housing Agency. In framing this outline, it will be necessary to indicate which elements of the merger would be contingent on prior reforms and which would be consequential upon the Dandora Project Department's own experience during its work on the Dandora Project.

## IV. TIME SCHEDULING FOR CONSULTANTS SERVICES AND REPORTS

The Consultants will be employed by the Nairobi City Council and shall commence field work in Nairobi, the "starting date" defined in this contract as being no more than 30 calendar days after the date on which the contract has become effective. The Consultants shall prepare 25 copies of each of the following reports (13 to be submitted to the City Council 5 to the Government and 5 to the World Bank):

(a) A Progress Report describing the Consultants' analysis and conclusions regarding the Nairobi City Council's existing housing and related services delivery system, its problems, bottlenecks and inefficiencies (see III (a) and (b)). The report should be submitted within two months of the starting date;

(b) A draft final report comprising the Consultants' findings under III (a) (b) and their recommendations under III (c), III (d) and III (e) above. Exhibits and other calculations supporting the Consultants' conclusions shall be made available to the City Council, the Government and the World Bank in sufficient detail to permit checking all calculations and to facilitate updating. The draft final report should be submitted seven months after the starting date with a finalized version to be available four weeks after receipt of comments from the Council, Government and the World Bank.

## V. SUGGESTED STAFFING

Considering the tasks to be performed it appears that 27 man-months for 2 professionals and 12 man-months of secretarial assistance will be required. Both professionals should have training in Housing Management or accounting-cum-financial management. One shall be specialized in housing adminsitration or management, the other in financial management with special reference to housing operations. Both should have had substantial experience advising governments, preferably in Kenya or countries comparable to Kenya in terms of their governmental systems and level of economic development.

## VI. INPUTS FROM THE GOVERNMENT OF KENYA AND THE NAIROBI CITY COUNCIL

The Nairobi City Council will provide the Consultants with office space in the Nairobi City Hall for the seven months of the contract. The report can be finalized at the Consultants' offices. The Nairobi Town Clerk and one senior civil servant from the Ministry of Local Government and one

from the Ministry of Housing and Social Services will be designated as liaison officers to assist the Consultants in their contacts with the Council and Government respectively. Council officers shall be available for interview about their work and the consultants shall have free access to all non-confidential and, with the Town Clerk's consent, to confidential written records and financial accounts pertaining to the Council's Housing operations. On the Consultant's appointment, he will receive from Nairobi City Council and available information mentioned in III (1).

## VII. THE CONSULTANT'S PROPOSAL

The Consultants are requested to submit their proposals on how they will carry out the study keeping in mind the time schedule required.

The proposals shall contain the curicular vitae of the staff to be deployed.

The Consultant shall on the basis of staffing suggested, propose his fee for the study and it shall be stated how much will be payable in Kenya and how much elsewhere.

Furthermore, the proposal shall contain man/month rates for each staff member.

## VIII. CONDITIONS AND LIMITATIONS

The Nairobi City Council reserves the right to reject any submission which in the Council's opinion is not suitably qualified or displays insufficient experience in this type of consultancy. The Council also reserves the right to accept any submission received in part or in full. Upon this matter the Council's decision is final.

## IX. TIME FOR SUBMISSION

Submissions shall have reached the Nairobi City Council, Town Clerk's Department before 1st May 1975, 4:00 p.m. Submissions received later will not be considered.

# PROPOSED GOVERNMENT OF KENYA/WORLD BANK STUDY OF LOW-COST HOUSING AND SQUATTER UPGRADING

## Draft Terms of Reference

1. As part of its efforts to make its housing programs more responsive to low-income accommodation requirements, the Government of Kenya is initiating a large Site and Services Project, the first in a series. Recognizing the valuable role which existing low-income/squatter steelements 1/ can play in the urbanization process, the Government is also considering the improvement in situ of certain of these areas as a complementary part of its housing program. Fundamental to upgrading is the granting of secure tenure rights and the development of various means by which residents may participate through self-help. Such programs would preserve and further develop on the existing housing stock and investment as well as the economic base and social fabric of selected settlements.

## I. OBJECTIVES

2. The purpose of preparing more site and services plots is to expand new low-income housing stock. The review of low-income/squatter settlements would assist Government in formulating programs for the upgrading of improvable existing unauthorized settlements in Nairobi, Mombasa and Kisumu, and in defining the means of strengthening the economic base of such areas in order to achieve continuing improvement.

3. The specific objectives of the study are as follows:

(a) to prepare proposals for providing about 20,000 site and service plots in Nairobi, Mombassa and Kisumu;

(b) to prepare improvement proposals for settlements identified by the Ministry of Housing and Social Services after consultation with the Local Authorities in terms of granting tenure, improvement of shelter and provision of public services and facilities, as opposed to those requiring eventual relocation;

(c) to prepare designs, cost estimates, economic justification and institutional arrangements in both improvement and site and services areas;

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1/ This refers to any settlement in which the majority of dwellings lack adequate infrastructure and services.

(d) to formulate specific proposals for strengthening the economic base of the settlements to be improved as well as site and services areas;

(e) to determine how, and to what extent the private sector can be induced to play a significant role in the low-cost housing market. The study should include the examination of financial institutions and rules, building standards and existing by-laws and other legislative and fiscal measures with a view to recommending appropriate modifications.

## II. SCOPE OF CONSULTING SERVICES

4. The Consultants shall perform all technical studies, socio-economic investigations and related work herein described, as required for the preparation of reports which will be utilized in the endeavor to achieve the objectives outlined above. In the conduct of this work the consultants shall cooperate fully with the Government and the local authorities in the towns in question which shall be responsible for providing all available data. The consultants shall collate existing data required for the Study and shall be solely responsible for the conclusions and recommendations contained in their reports.

5. The Consultants shall review, sort and index all data, maps and reports that are (i) made available in the course of study by the Government and other organizations; and (ii) collected by the Consultants. Upon completion of this assignment the Consultants shall submit these materials to the Ministry of Housing and Social Services.

6. The Study will be conducted in the following sequence:

PHASE I

(a) Identification of sites for about 20,000 site and service plots in the three towns, about one-half to be developed in Nairobi and the remainder in Mombasa and Kisumu.

(b) A quick review of existing information on unauthorized settlements including informal sector employment activities in the towns concerned, updating information, where necessary through field surveys.

(c) Develop more detailed physical and socio-economic information on each of the settlements selected for upgrading.

(d) Itemization of proposed improvements including design standards.

PHASE II

(e) Development of layouts, designs, land requirements, preliminary engineering and cost estimates for settlements to be upgraded and site and service areas. Programs for stimulating employment and income generation should also be costed.

(f) Analysis of economic benefits.

(g) Formulation of the institutional arrangements for project implementation, participation of the private sector, granting of tenure, cost recovery and collection procedures.

PHASE I (a)

7. The Consultants shall identify sites for about 20,000 site and service plots, paying particular attention to how the sites fit into the towns' Master Plan, their accessibility to employment centers and proximity to existing infrastructure. The Consultants shall examine alternative design standards for the site and services at least by town and where appropriate by site. Account should be taken of the following factors: people's ability to pay and the desirability for the plots to be affordable by households as low as the 20th percentile in the income scale.

PHASE I (b)

8. The Consultants shall attempt to maximize the use of existing information, particularly in Nairobi where a fairly substantial amount of data is available. Such material should be updated where necessary; information gaps identified, and brief surveys conducted sufficient to provide a basis for reasonable decision making. Such review should address itself, inter alia, to the following:

(i) the extent of unauthorized development; estimated population, physical coverage, and (growth trends) concentrations and reasons for locational choices;

(ii) socio-economic characteristics of households such as size and composition, employment and income; the existence of functioning harambee (self-help) groups;

(iii) housing: physical characteristics and value of dwellings, population density, nature of present occupancy, desired occupancy (ownership or rental), level of rents;

(iv) public utilities and facilities: roads, water supply, sanitation, sewerage, waste disposal, electricity, schools (including health clinics, fire protection, etc.);

(v) formal and informal sector employment including ongoing assistance programs; location and nature of markets, financing, growth potential and constraints; and

(vi) transportation: mode of transport, destinations.

PHASE I (c) - Detailed Analysis of Selected Settlements

9. Information on specific physical and socio-economic characteristics of these settlements required for detailing an upgrading program will be collected by the Consultants, with particular attention to existing land-use patterns and ownership and demography, employment and other economic activities, income levels, housing and general environmental conditions such as existing infrastructure and services, local institutions, leadership and residents' attitudes regarding improvement. The Consultants shall be responsible for designing survey questionnaires, identifying and hiring competent personnel to carry out the surveys, supervising the implementation and recording, and processing of data. Such surveys should be confined to information required for project preparation, and the terms of reference outlined above.

PHASE I (d) - Itemization of Proposed Improvements

10. The steps outlined in (b) and (c) above should result in the identification of appropriate improvements which reflect to the extent possible priorities expressed by the resident population with some modification based on a realistic assessment of occupant's ability to pay. Where appropriate, the staffing and operating costs of each of the facilities and programs provided under the project should be determined and the agency responsible for operation and maintenance specified. The proposals should clearly spell out the priorities among services to be provided, and the design and engineering standards to be achieved with respect to each of the selected amenities. All designs should be suitable for future upgrading as residents' incomes gradually rise and dwelling and servicing needs change. Consideration should be given, inter alia, to the following types of improvements:

(i) infrastructure (water, roads, footpaths, sanitation, refuse collection, electricity, and security lighting) including any off-site trunk infrastructure considered essential to project execution;

(ii) community facilities (e.g., schools, health clinics, community centers, recreational areas);

(iii) facilities, technical assistance stimulating job creation and other activities (markets, shops, and small industrial areas);

(iv) shelter improvement; and

(v) transportation.

11. Upon completion of the above task, the Consultants shall submit to the Government, the Local Authorities concerned, and the Bank a Progress Report presenting their recommendations based on the findings from the review and analysis to date.

PAHSE II (e) - Preliminary Layouts, Design and Costs

12. On the basis of their findings in Phase I, the Consultants shall develop layouts for both site and services and improvement areas. Regarding improvement areas, the layouts shall maximize the use of existing roads, community areas, etc., wherever possible, and establish a framework suitable for more complete servicing at a later stage. Spatial provision should be make for dwellings requiring relocation because of improvements. Land requirements should be identified including, where relevant, procedures necessary for transfer. Preliminary engineering and designs should be completed for all infrastructure (on/and off-site) and community facilities to be included in both upgrading and site and service areas, together with cost estimates. Items to be constructed through self-help should be costed at contractor prices. Costs should be broken down by settlement and investment type. 1/ Back-up data designs and costs should be retained by the Consultants in an easily accessible form. If building materials loans are to be included in the project, details should be given as to whether these would be in cash or kind, average and ceiling amounts, and administration. Specific proposals for strengthening the economic base of these communities should be described, including the type of activities affected, their major constraints, the focus and content of the recommended program and the extent of any proposed regulations.

PHASE II, (f) - Analysis of Economic Benefits

13. The Consultants shall identify the benefits of the proposed upgrading of the facilities, quantifiable and non-quantifiable. For the quantifiable benefits the Consultants shall calculate a rate of return comparing benefits with costs including land development (opportunity cost) and maintenance. The rate of return analysis should clearly spell out the methodology used and key assumptions. The Consultants shall submit a separate technical paper on methodology to the Government and the Bank before carrying out their detailed calculations.

PHASE II (g) - Institutional Arrangements

14. The Consultants shall formulate proposals for an appropriate institutional base for the execution of both site and services and upgrading schemes and the required organization and management including staffing and

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1/ Costs by category, i.e., infrastructure, community facilities, etc., and type of work, i.e., civil works, materials and equipment.

technical assistance. The Consultants shall also recommend an objective allocation procedure for site and services. A suitable tenure period should be identified as well as the instruments to be used in issuing titles, leases or occupancy permits and the appropriate institutional base. The consultants shall indicate whether an adequate legislative basis exists or is needed in order to achieve secure tenure rights. Existing building by-laws and development codes should be reviewed to ensure these regulations are consistent with proposed improvements and construction standards. Recovery sources for the various types of expenditures shall be outlined identifying clearly those attributable to households. An approximation should be made of the monthly charge to participants based on 1975 costs, and including all relevant municipal rates and taxes, accompanied by an analysis of occupants' ability to pay. Collection procedures should be outlined, an estimate made of the anticipated level of default, and recommendations made on the handling of such defaults covering all steps up to and including eviction procedures. An estimated work program should be prepared specifying the various phases of project execution. The program should incorporate the steps preceding ground-breaking such as community education and essential resettlement, and should spell out in practical terms the role of the community itself in executing the project. Components requiring self-help participation should be phased to maximize completion of each task with priority facilities executed first. At the completion of the tasks outlined above, the Consultants shall prepare a Final Report covering the analysis and conclusions under both Phase I and II of the Study.

Important data developed during the Study should be properly catalogued and made available for discussion purposes during project execution.

## III. TIME SCHEDULE AND REPORTS

15. The Consultants shall commence field work on the "starting date," defined in this contract as being no more than 30 calendar days after the date on which the Contract has become effective. The Consultants shall prepare 25 copies of each of the following reports for submission to the Government, the Local Authorities concerned and the Bank respectively:

(i) a Progress Report describing the proposed improvements in up-grading areas, sites for 20,000 plots and recommended design standards should be submitted within eight months of the starting date;

(ii) a comprehensive Final Report outlining the scope and nature of the improvement and site and services project and detailing layouts, infrastructure, land requirements, community facilities, costs and institutional arrangements as itemized under Section II above. Specific provisions should be made for strengthening the economic base of the communities affected. The data and calculations which

support the consultants' conclusions shall be made available to the Government, the Local Authorities concerned, and the Bank in sufficient detail to permit checking all calculations and to facilitate updating and adjustment for changes in basic data. A draft Final Report should be submitted 12 months from the starting date, with a finalized version to be available four weeks after receipt of Government and Bank comments.

16. In view of the tasks to be performed and the time period allowed, a staffing unit of five professionals should be sufficient to complete the preparation. Their profiles should cover the following areas:

(i) Project Manager: an experienced physical planner with knowledge of sociology, economics, and if possible, practical experience in similar sorts of projects;

(ii) A Municipal Engineer with particular expertise in urban infrastructure and public utilities;

(iii) A Sociologist preferably with extensive local knowledge and familiarity with the characteristics of very low-income and squatter communities;

(iv) An Economist with some experience in informal sector analysis; and

(v) A Legal Expert experienced in land management.

## VI. PROVISION OF DATA AND SERVICES BY GOVERNMENT

17. The Government and Local Authorities concerned shall provide the Consultants with available data and reports relevant to their work and liaison staff. The Consultants shall liaise with the University and other volunteer agencies actively involved in research or development programs in squatter and low-income settlements. The Government agency responsible for this study will be the Ministry of Housing and Social Services which will assign one person to assist, guide and help coordinate the Consultants activities.

KENYA

APPRAISAL OF A SITE AND SERVICE PROJECT

Estimated Schedule of Disbursements

| IBRD Fiscal Year and Quarter | Disbursement at End of Quarter | |
|---|---|---|
| | Quarterly | Cumulative |
| | US$ million | |
| **FY1976** | | |
| December 31, 1975 | 1.2 | 1.2 |
| March 31, 1976 | 0.9 | 2.1 |
| June 30, 1976 | 0.9 | 3.0 |
| **FY1977** | | |
| September 30, 1976 | 0.9 | 3.9 |
| December 31, 1976 | 0.9 | 4.8 |
| March 31, 1977 | 1.5 | 6.3 |
| June 30, 1977 | 1.5 | 7.8 |
| **FY1978** | | |
| September 30, 1977 | 1.5 | 9.3 |
| December 31, 1977 | 1.5 | 10.8 |
| March 31, 1978 | 0.85 | 11.65 |
| June 30, 1978 | 0.85 | 12.50 |
| **FY1979** | | |
| September 30, 1978 | 0.85 | 13.35 |
| December 31, 1978 | 0.85 | 14.20 |
| March 31, 1979 | 0.45 | 14.65 |
| June 30, 1979 | 0.45 | 15.10 |
| **FY1980** | | |
| September 30, 1979 | 0.45 | 15.55 |
| December 31, 1979 | 0.45 | 16.00 |

KENYA

APPRAISAL OF A SITE AND SERVICE PROJECT

Economic Evaluation

Cost and Benefit Streams
(KL '000)

| | 1 | 2 | 3 | 4 | 5 | 6 | 7-40 |
|---|---|---|---|---|---|---|---|
| **Project Costs** | | | | | | | |
| Land 1/ | 667 | - | - | - | - | - | - |
| Site Preparation | 23 | 91 | 22 | - | - | - | - |
| On-Site Infrastructure | 98 | 357 | 517 | 259 | - | - | - |
| Cost of Structures: 2/ | | | | | | | |
| Value of Materials | 94 | 484 | 780 | 533 | 429 | 720 | - |
| Labor | 21 | 148 | 254 | 199 | 214 | 360 | - |
| Project Operating Costs: 3/ | | | | | | | |
| Maintainance | - | 2 | 8 | 17 | 21 | 21 | 21 |
| Project Unit Operations | 100 | 100 | 100 | 48 | - | - | - |
| Total Costs 4/ | 883 | 1040 | 1479 | 929 | 584 | 969 | 19 |
| **Project Benefits** | | | | | | | |
| Imputed Rental Value 5/ | - | 36 | 72 | 324 | 864 | 1,296 | 1,296 |
| Land | - | - | - | - | - | - | 667 1/ |
| Total Benefits | 0 | 36 | 72 | 324 | 864 | 1,296 | 1,963 |
| Rate of Return = 16.95 | | | | | | | |

1/ Land - estimated market value: on benefits side it has been included for the last year only.

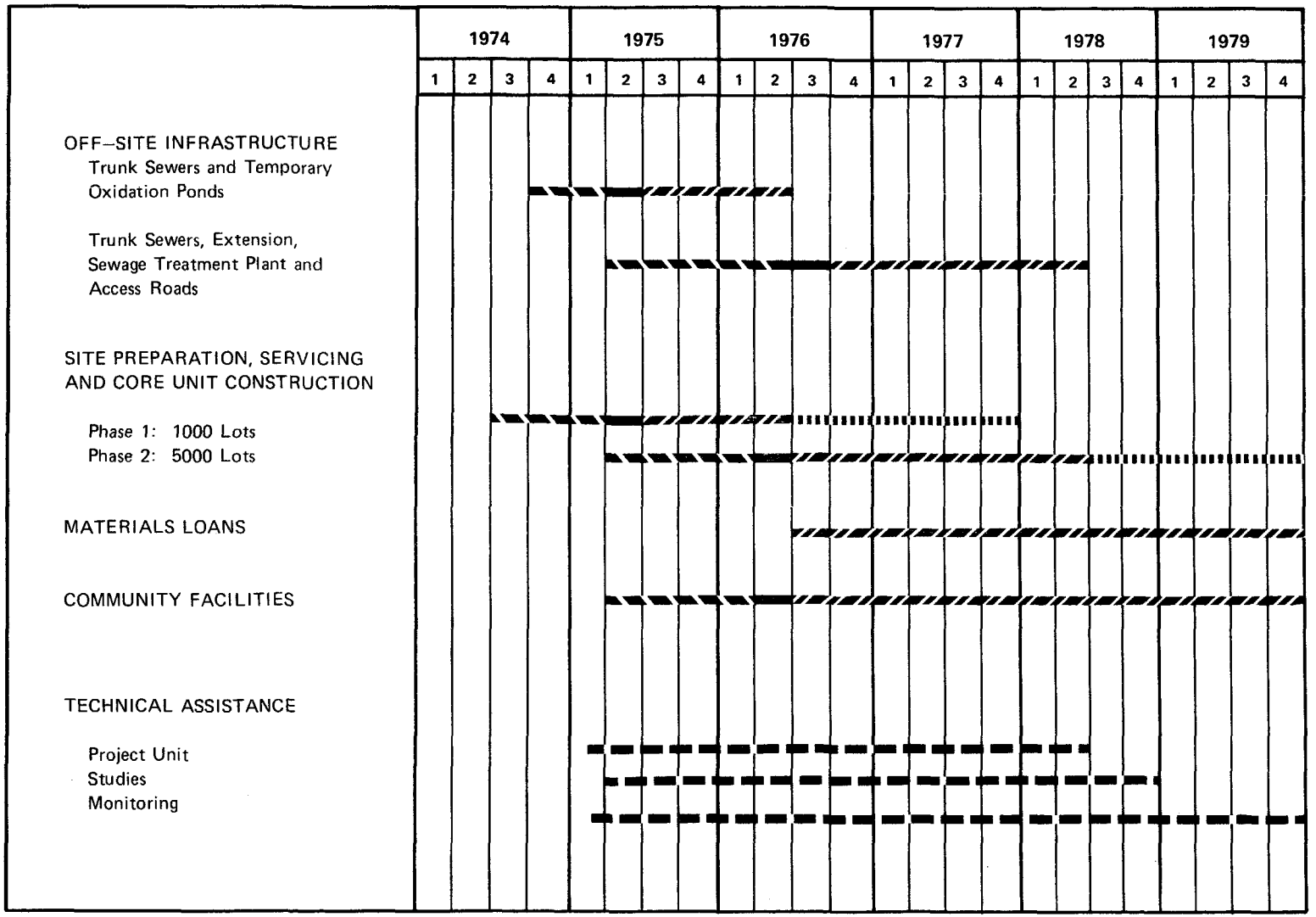
2/ Core units have 23% labor (see Annex 5, Tables 2-4) and self-built rooms have 40% labor. Labor is shadow priced by a factor of 25%. This figure is assumed to be reasonable in view of the relatively high unemployment rate in Nairobi of 13% rising to 20% in squatter areas. Moreover, much of the work on self-built housing is typically done by women who are not a part of the labor force and on weekends by those who are employed.

3/ Assumed at 2% of costs of on-site infrastructure; Project Unit costs have been included only for first four years. Although some management will continue to be necessary after project construction it will be small and is difficult to estimate.

4/ Foreign exchange has been shadow priced at US$1 = KSh10 instead of the official US$1 = KSh7.10. This results in total costs being reduced by 12%.

5/ Assume 1,000 rooms at KL6 per room per month are ready for half a year in 1976 and a full year in 1977, the same 1,000 with two rooms ready in 1978 and 5,000 with one room ready for half a year in 1978, 6,000 with two rooms in 1979, 6,000 with three rooms in 1980, and thereafter. Rental figures reflect charges for units of a comparable standard to those in the project, and which are not serviced with water or sewerage. Figures are based on 1971/72 survey results.

KENYA
APPRAISAL OF A SITE AND SERVICE PROJECT
Construction Schedule




LEGEND

Design

Tendering

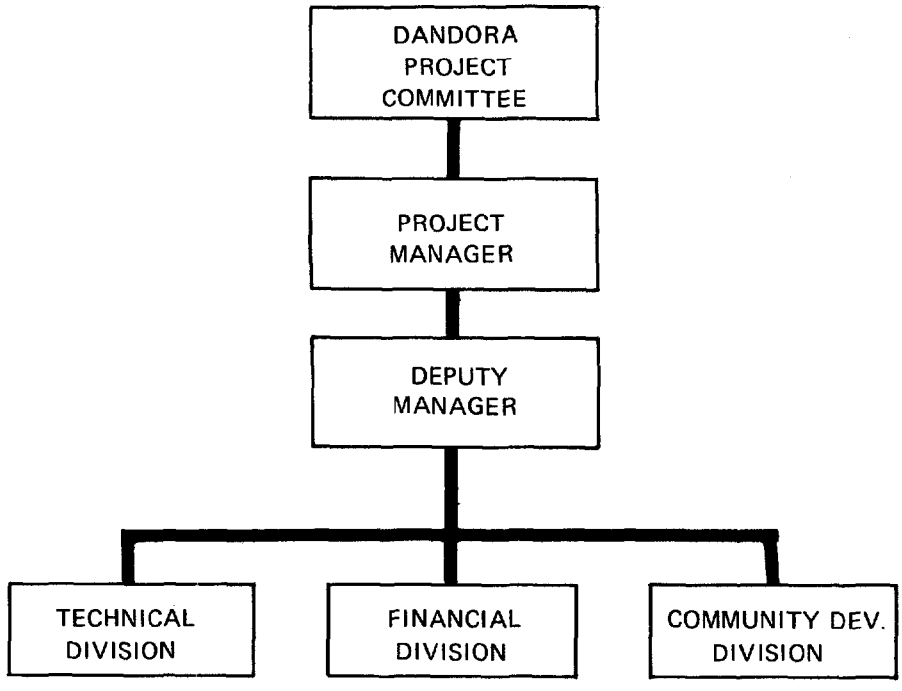
Construction

Allottees Construction of Basic Dwellings

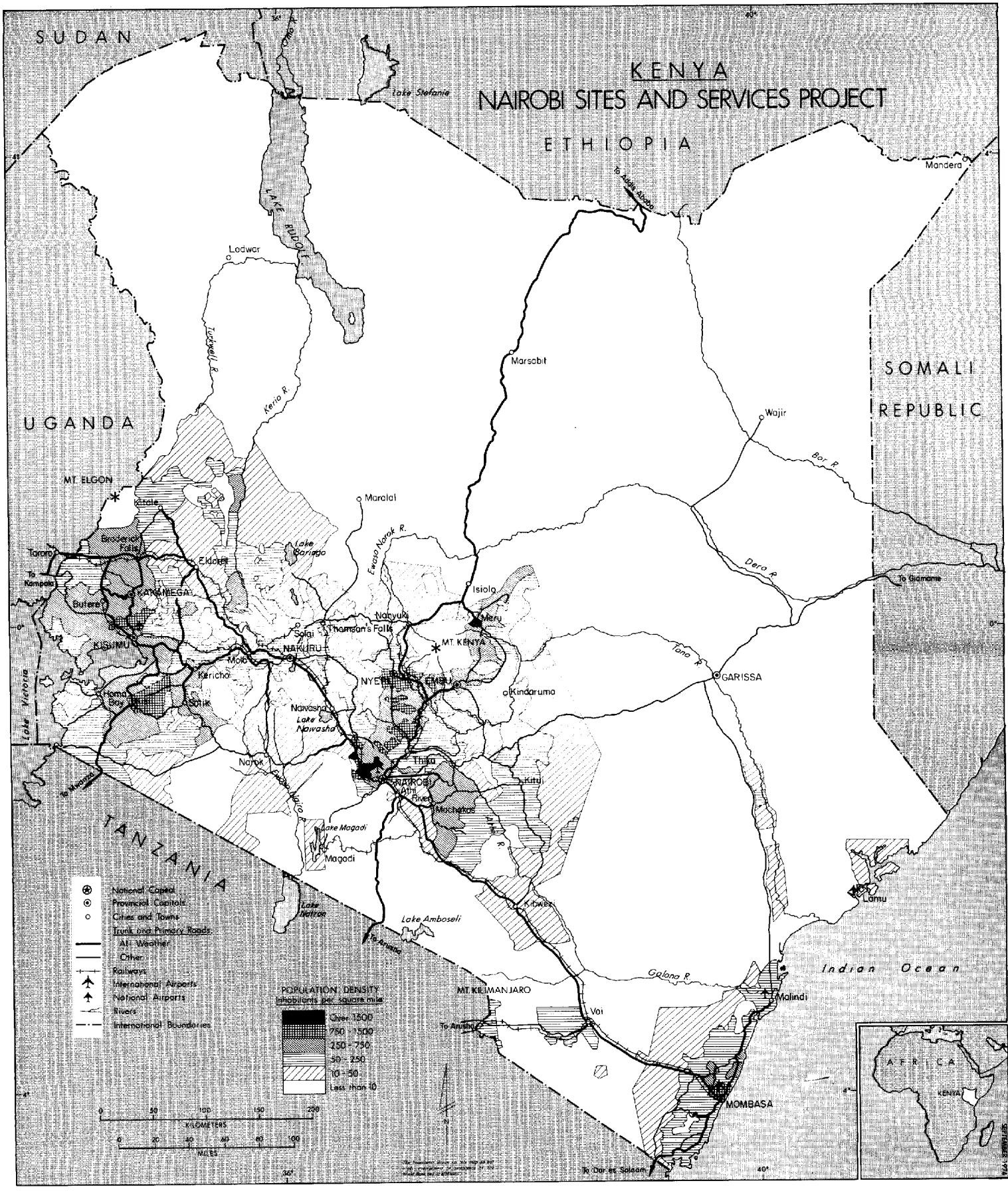
Technical Assistance

World Bank–9324

## PROJECT UNIT ORGANIZATION




World Bank–9325(R)


KENYA
NAIROBI SITES AND SERVICES PROJECT
SUDAN
ETHIOPIA
UGANDA
SOMALI REPUBLIC
TANZANIA
Indian Ocean
Lake Stefanie
LAKE RUDOLF
Lodwar
Turkwell R.
Kerio R.
Marsabit
Mandera
To Addis Ababa
Wajir
Bor R.
Dera R.
To Giamame
Maralal
Ewaso Narok R.
Isiolo
Meru
Nanyuki
Thomson's Falls
Solai
NAKURU
MT. KENYA
Tana R.
GARISSA
Kindaruma
NYERI
EMBU
Naivasha
Lake Naivasha
Thika
NAIROBI
Athi River
Machakos
Kitui
Narok
Lake Magadi
Magadi
Lake Natron
Lake Amboseli
To Arusha
Kibwezi
Galana R.
Lamu
Malindi
MT. KILIMANJARO
Voi
To Arusha
MOMBASA
To Dar es Salaam
MT. ELGON
Kitale
Broderick Falls
Tororo
To Kampala
Eldoret
Lake Bariago
KAKAMEGA
Butere
KISUMU
Molo
Kericho
Homa Bay
Sotik
Lake Victoria
To Mwanza
National Capital
Provincial Capitals
Cities and Towns
Trunk and Primary Roads
All Weather
Other
Railways
International Airports
National Airports
Rivers
International Boundaries
POPULATION DENSITY
Inhabitants per square mile
Over 1500
750 - 1500
250 - 750
50 - 250
10 - 50
Less than 10
KILOMETERS
MILES
AFRICA
KENYA
IBRD 11067

IBRD 11068

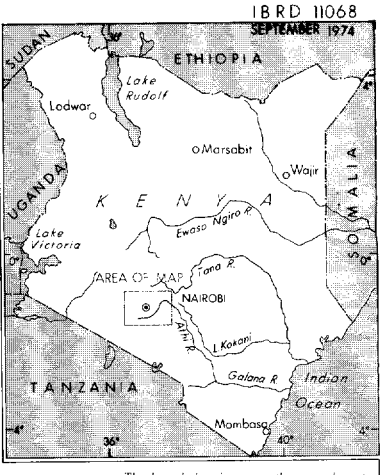
SEPTEMBER 1974

# KENYA

# SITES AND SERVICES PROJECT REGIONAL SETTING OF NAIROBI

AREAS OF GREATEST POTENTIAL FOR DEVELOPMENT IDENTIFIED BY NAIROBI URBAN STUDY
PROJECT SITE
MAIN ROADS
RAILWAYS
CITY BOUNDARY
BUILT-UP AREAS
7400 CONTOURS IN FEET
RIVERS

0 10 20
KILOMETERS

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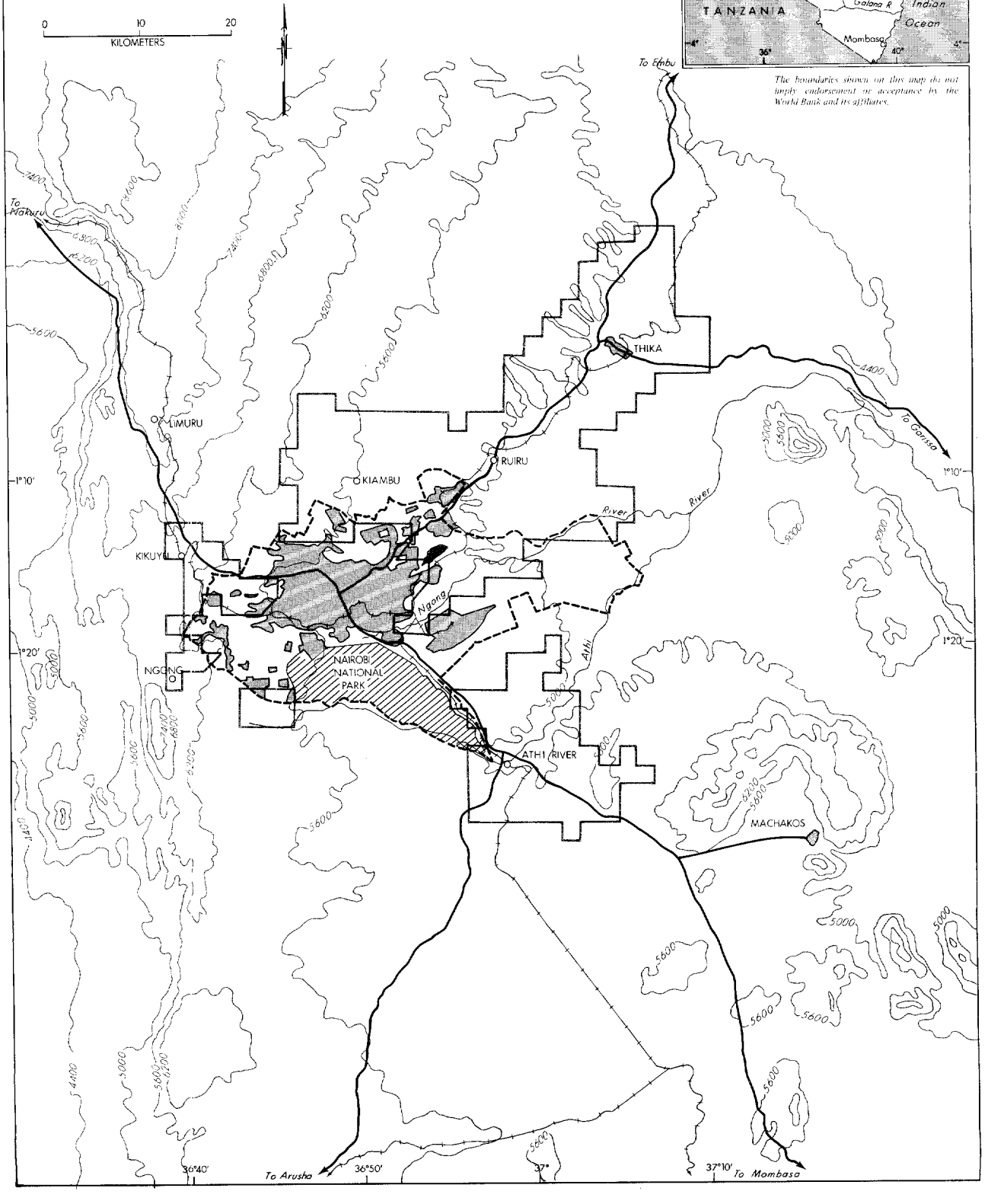
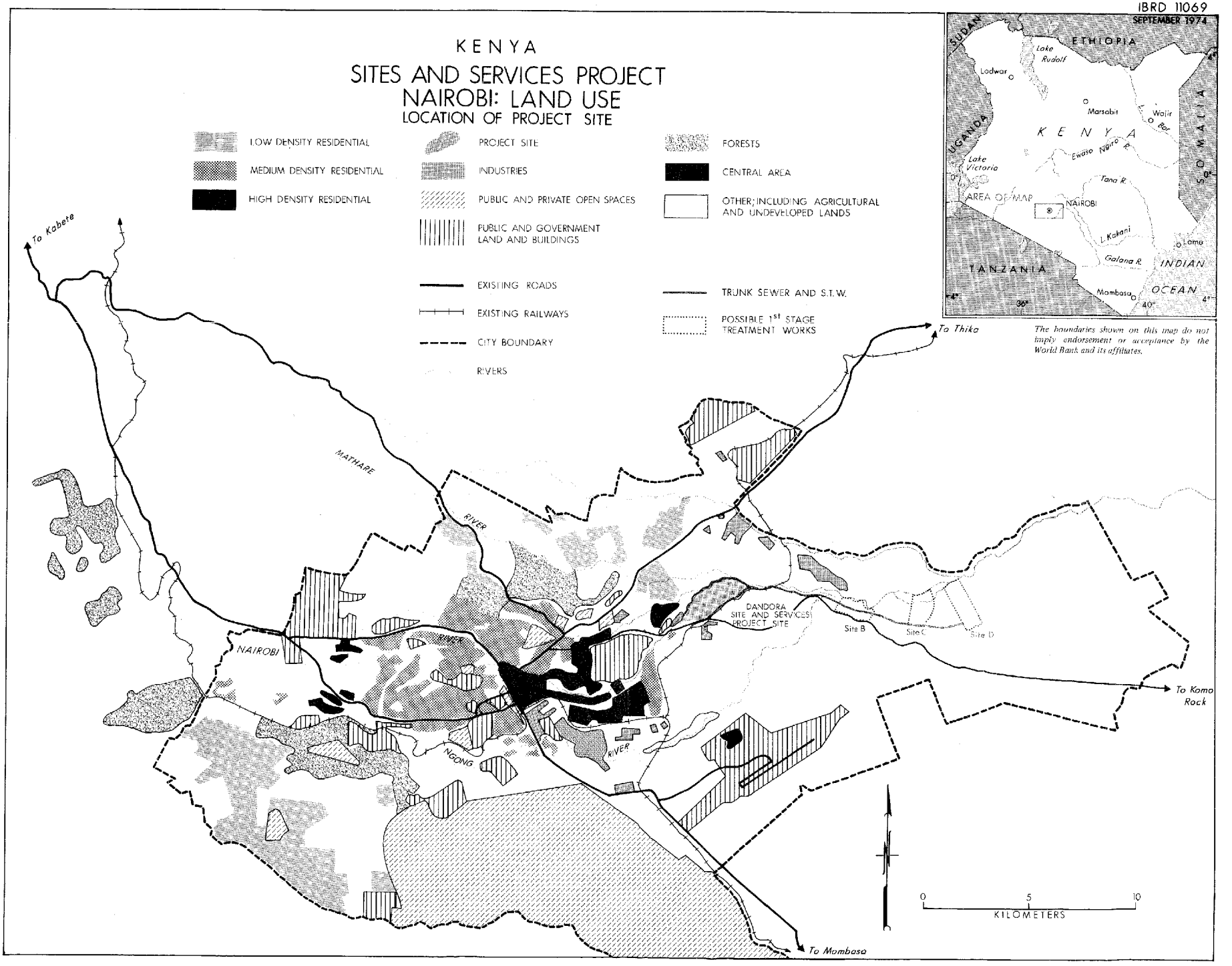


IBRD 11069
SEPTEMBER 1974

# KENYA
## SITES AND SERVICES PROJECT
## NAIROBI: LAND USE
### LOCATION OF PROJECT SITE







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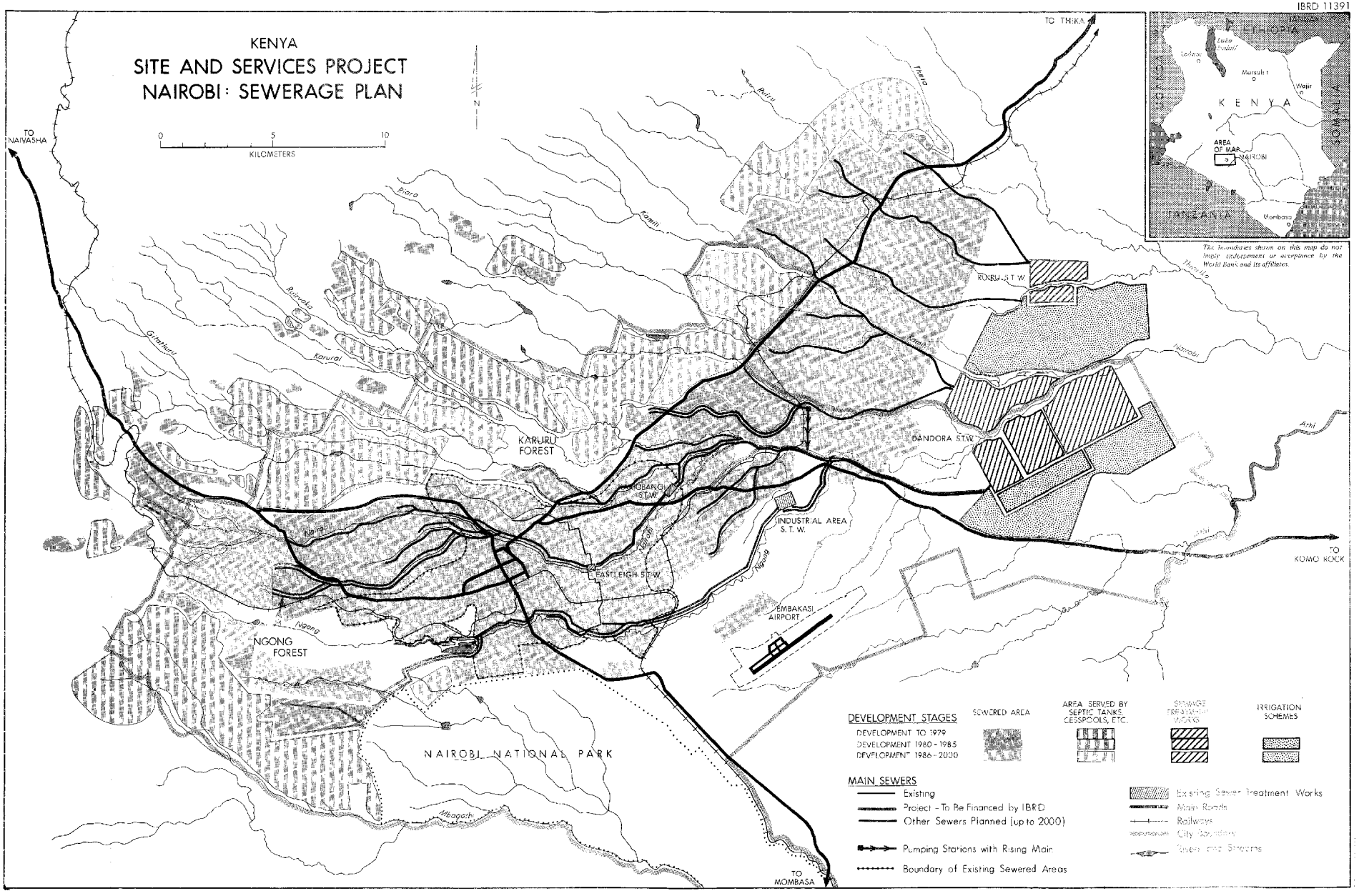
IBRD 11391

# KENYA
# SITE AND SERVICES PROJECT
# NAIROBI: SEWERAGE PLAN

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