

## 第6章 本格調査実施方針

### 6.1 調査の基本方針

- (1) ナイロビ市を対象として制度、組織、事業等の廃棄物行政を中心とした廃棄物管理に関するマスタープランを策定し、優先プロジェクトに関するフィージビリティスタディー調査を行い、調査をとおして c/p に廃棄物管理に関する技術移転を行う。

- (2) マスタープランの目標年次は、以下の理由により 10 年間、2008 年とする。

ナイロビ市の廃棄物管理に関する行政能力は大きく立ち後れている。具体的には基本計画の欠如、基本計画に基づく日、週、月、年ごとの各事業計画、管理計画の欠如などおよそ行政の基本がまるまできていない。その結果は全く悲惨なもので、減価償却財源など保守管理財源の不足からくる収集・埋立作業車両の極端な不足、整備不良による非効率な作業によってナイロビ市内の廃棄物の収集輸送体制の崩壊による居住環境や埋立地周辺の環境を著しく悪化させている。このような状況を改善するにはケニア政府の支援のもと、ナイロビ市が行政機構の抜本的な改革を図り、廃棄物管理に関する行政能力を向上させる以外に方法はない。本調査でなされるマスタープランはこれらの行政能力の向上を基礎に構築されるものである。そこで、F/S を含む最初の 5 年を行政能力の向上に主眼を置く。

しかし、都市の居住環境の改善のための行政能力の向上だけでは、すなわち収集・輸送・最終処分計画の計画的な事業だけでは、次に廃棄物管理費用の増大と埋立処分場の寿命短縮が起これ、計画の修正を余儀なくされるのは明らかである。今日、先進国あるいは途上国においても廃棄物の多様化と増加は廃棄物管理費用を止めどもなく増大させるばかりでなく、最終処分場の確保に大きな不安を抱かせており、廃棄物の減量化のための懸命な努力が各国・各自治体でなされている。そのため、マスタープランでは次の 5 年を廃棄物の減量化計画を盛り込んだ減量化・再資源化・リサイクルを中心的な課題として取り扱うことになる。ここではさらにリサイクル事業を民営化の柱に据えて、事業の活性化を図ることが重用になるであろう。以上のように、マスタープランは 2 期から構成されており、これらが段階的に進まないでナイロビ市当局の廃棄物行政は崩壊する懸念がある。

- (3) 調査対象地域は原則としてナイロビ市の行政区とするが、埋立処分場に限っては区域外となっても対象地域に加える。現在、提案されている処分場候補地は採石採掘穴で非常によい埋立候補地ではあるが、市の中心地から 10 キロ以内と極めて近く、不法居住区ではあるが多くの住民が居住していることもあり、住民合意をとりつけることに不安が残る。また、ナイロビ川の支流ンゴング川に隣接しており、洪水の影響を受けることも考えられる。従って、候補地としては居住区より離れた場所を選定する必要があり、場合によっては行政区を越えて建設することも考慮に入れておくことが必要である。

- (4) 調査対象廃棄物は家庭ごみ、市場ごみ、商業ごみ、道路清掃ごみおよびオフィスごみに限定する。ケニア側から産業廃棄物および病院ごみを含めるよう要請があったが、ケニアの廃棄物管理能力を考えると、まずいわゆる一般廃棄物の管理事業を成功させるとの考え方から、これらは先の目標年次の項で示したようにマスタープラン第 2 期に政策的提言のみに止めることにする。

- (5) 本格調査団に対するカウンターパートとして少なくとも (ア) 廃棄物局 (清掃局)、(イ) 収集輸送部、(ウ) 埋立処分部、(エ) 計画部、(オ) 事業管理部、(カ) 事業経理部、(キ) 人材開発部及び(ク) 法制度関連部の責任者を組織する必要がある。
- (6) 本格調査の権威付けに対して決定権を有し且つ責任を負っているステアリング委員会が組織される必要がある。このステアリング委員会の委員は、ナイロビ市廃棄物管理の抜本的改善、特に制度的な改善をも含んでいることから、財政、都市計画、人材開発等ナイロビ市の基本政策を決定できる役職から選定される必要がある。
- (7) 提案された処分場候補地はマスタープランの中で決定されることが肝要である。そして、フィージビリティースタディーが処分場建設計画を含んでいる場合、ナイロビ市は住民合意が得られ、並びに環境影響評価の要求項目に適合している用地の確保に責任を持つ必要がある。
- (8) 廃棄物管理のための組織・制度を強化することは極めて重要である。そのため、本格調査では法・行政・組織整備、運営、維持管理、財源等の廃棄物管理に関する諸組織・制度の改革を中心に据えて行う必要がある。その上で、実行可能な計画の作成が重要になる。
- (9) ナイロビ市の衛生環境を改善するのに活動している団体として、民間セクター、NGO 及びスカベンジャーなどの団体があるが、事前調査によってこれらの団体の役割が少なくないことが明らかにされた。本格調査ではこれらの団体の活動とその寄与について更なる詳細な検討が必要である。特に民間セクターは、高級住宅地や一部の事業所についてはあるが、廃棄物収集輸送事業の民営化の一つのモデルとして、またリサイクル事業を推進する場合の民営化のモデルとして位置づけることが可能である。一方、NGO の低所得住宅地、あるいはスラム地域における中継地点へのごみ輸送システムの開発 (住民組織の利用した手押し車等による収集) に重要な役割を担うものと期待される。
- (10) S/W によれば、第 1 期マスタープランにおいて詳細なパイロットスタディーが作られ、第二期フィージビリティースタディーにおいてそれが実施される。そのパイロットスタディーはマスタープランの中で提案される施策を実験することによって、市の廃棄物管理事業能力が改善されることを実証することにある。すなわち、ナイロビ市の現存の人的・物的資産を利用し、ナイロビ市自身によってこの実験が行われ、既存の廃棄物管理事業能力と新たに作られた廃棄物管理計画に沿った事業能力を明らかにすることによって、計画的廃棄物管理事業の重要性を明らかにするものである。

## 6. 2 調査実施上の留意点

- (1) 現在ナイロビ市では、治安状態が極めて悪く夜間の外出は特に危険な状態にある。この背景には、地方部より職を求めてナイロビ市へ人々が流入するも、ナイロビ市で職にありつけない人々による金品の強奪などの犯罪が多発していることによる。したがって、夜間での調査には特に治安に関して注意を払う必要がある。また、現最終処分場周辺もスラム街が形成されており、調査団のみで調査を行うには危険な状態にあると思われるので、この地域の調査にはナイロビ市当局の人の同行が必要と考えられる。
- (2) ナイロビ市環境部は 1996 年 6 月に公衆衛生部及び土木部から分離、発足したばかりであり、組織及び実施体制がまだ万全とはいえない状態にある。また現在これ程までナイロビ市における

廃棄物処理事業が問題になっているにも関わらず、ナイロビ市当局が適切な処置を行ってこなかったことを考慮すると、今後も飛躍的な行政能力改善が行われるとは言い難い。したがって本件調査では、ナイロビ市の廃棄物管理業の組織及び実施体制の改善計画を提案するが、現実にもしいた実現可能な計画にすることである。

- (3) また廃棄物管理事業計画を考える場合、かかるハードの充実（収集車両等）が重要と短絡的に考えがちであるが、本件調査においては廃棄物管理事業能力の向上を目的としたソフト面の充実が最優先であると考えられる。つまり現状においては、廃棄物管理事業に問題があるのは収集車両の老朽化及び不足に起因するものより、適切な運営体制（日々の収集計画、収集量の把握、料金徴収、人員の配置、予算の計上、人材育成、組織体制等、及びかかる管理体制）の不備に起因するものが大きいものと考えられる。

### 6. 3 調査項目及び内容

#### (1) 調査の目的

- 1) ナイロビ市の保健・衛生、環境改善に資するための廃棄物管理計画のマスタープランを作成し、優先プロジェクトにかかるフィージビリティ調査を実施する。
- 2) 調査を通じたカウンターパートへの計画手法の技術移転を行う。

#### (2) 調査の構成

- フェーズ1 : 2008年を目標年次とした廃棄物管理にかかるマスタープランを策定する。  
第一優先課題は事業実施能力向上の基本計画の策定であり、廃棄物管理事業体の組織・制度の整備、財政の強化、管理能力の向上に主眼を置くものとする。
- フェーズ2 : 策定されたマスタープランに基づき、優先プロジェクトにかかるフィージビリティ調査を実施する。

#### (3) 調査項目及び内容

##### フェーズ1 : マスタープランの策定

#### (7) 基礎調査

##### 1) 既存資料・情報の収集・分析

ナイロビ市の廃棄物にかかる問題点を理解し課題を確認するために、既存資料及び関係者からのヒヤリングを行う。

- (a) 自然条件
- (b) 社会経済状況
- (c) 土地利用状況
- (d) 廃棄物及び環境にかかわる法制度
- (e) 財政状況
- (f) 廃棄物及び環境にかかわる政策
- (g) 関連計画

## 2) 現状調査

以下に掲げるナイロビ市における項目についての調査を行い、廃棄物に係わる現状の把握を行う。

- (a) 廃棄物処理状況
- (b) 廃棄物管理機材維持管理状況
- (c) 資源回収状況
- (d) 住民衛生状況
- (e) 組織運営能力状況
- (f) 人材育成状況
- (g) 廃棄物による環境汚染状況
- (h) NGO、スカベンジャー、民間企業等による廃棄物処理状況

## 3) 実査

以下の項目に関して実査を行い、廃棄物にかかる定量的データを収集する。

- (a) ごみ量、ごみ質
- (b) タイムアンドモーション
- (c) 住民衛生意識

### (イ) 現状の評価と課題の抽出

基礎調査結果に基づき、都市計画、環境衛生、健康、関連事業、住民意識、施設、資機材、制度・組織、管理運営能力、財政、法制度の面から廃棄物管理の現状の評価、課題及び制約要因の抽出を行う。

### (ロ) 基本計画の策定

#### 1) 計画フレーム及び基本方針の検討

目標年次までの人口増加、経済成長、ごみ排出量、ごみ質の変化を予測し、かつ都市開発計画を考慮しながら本件調査の計画フレーム及び基本方針を検討する。

#### 2) 計画諸元の検討

計画フレーム及び基本方針に基づき、廃棄物処理方法、収集方法、組織強化、人材育成、財務計画等を含む本件調査の計画諸元を検討する。

#### 3) 最適案及び代替案の策定

検討された基本方針にかかる最適案及び代替案を策定する。

#### 4) 組織制度計画

基本方針に基づき、廃棄物管理事業実施能力向上の基本計画を策定する。この中では、組織制度整備、財政の強化計画を提言する。そして、かかる計画を前提として、廃棄物処理計画、廃棄物処理民間委託計画を策定する。

#### 5) 施設概略計画

廃棄物処理計画に基づき、必要とされる施設の概略計画及び必要な資機材の調達（現地調達、輸入等）の計画を策定する。新たな最終処分場はここで決定するものとする。

#### 6) 概算事業費積算

策定された組織制度計画及び施設概略計画にかかる施設についての概算事業費を積算する。

(エ) マスタープランの評価

策定されたマスタープランに関し、社会・経済効果、財政、環境、実現性等の面から評価を行う。

(オ) 実施計画

1) 段階別実施計画

策定されたマスタープランに対して、緊急性、財政、実現性等を考慮しプライオリティー付けを行いながら、段階別実施計画を策定する。

(カ) 優先プロジェクトの選定

1) 優先プロジェクトの選定

段階別実施計画を基に、フィージビリティ調査を行う優先プロジェクトを選定する。

2) パイロットスタディーの立案

パイロットスタディーは 2 つの目的を持つものとする。1 つ目はナイロビ市の管理運営能力の改善を目的とするものである。これはナイロビ市の既存の人的・物的資産を利用することを前提とし、今までの調査結果によって明らかになった現行のナイロビ市の廃棄物管理計画の問題点を分析した後、新たに廃棄物管理計画を策定しパイロットスタディーにおいて実施するものである。2 つ目は廃棄物処理への住民参加の可能性の検証を目的としたものであり、住民による衛生意識の向上、廃棄物の収集場所への計画的な排出等を試みる。

フェーズ 2 : 優先プロジェクトに係わるフィージビリティ調査

(7) 補足基礎調査

1) 補足資料収集・分析

策定された優先プロジェクトに対して、フェーズ 1 での不足分を補う資料収集・分析を行う。

2) 補足現状調査

フェーズ 1 での不足分を補う現状調査を行う。

3) 補足実査

フェーズ 1 での不足分を補う実査（測量等）を行う。

4) 環境影響評価の実施

優先プロジェクトにかかる施設の環境影響評価（EIA）を実施する。

5) パイロットスタディーの実施

フェーズ 1 で選定したパイロットスタディーを実施し、①ナイロビ市当局の廃棄物管理実施能力を検証及び廃棄物管理計画の重要性の提示②廃棄物処理にかかる住民参加の可能性の検証を目的とする。

(イ) 解析

1) 計画諸元の詳細検討

フィージビリティ調査にかかる詳細な計画諸元を検討する。

(ウ) 計画

1) 組織・制度・人材育成計画

廃棄物管理事業体の組織・制度及び人材養成に改善実施計画を策定する。また、民間の廃棄物処理業者、リサイクル業者の育成実施計画及び行政機関との役割分担等についても検討する。さらに廃棄物管理の責任分担意識を高める目的で、環境教育の実施計画についても検討する。

2) 施設計画

優先プロジェクトにかかる施設の概略設計を行う。さらに各施設に必要な主要資機材について、数量、仕様、調達（国内生産／輸入）等の計画を策定し、建設工程、資機材の購入工程について、実現性を考慮した計画を策定する。そして、施設・機材の運用、メンテナンス、リハビリ等のスケジュールなど、運営・維持管理計画を策定する。

3) 財務計画

適切な廃棄物収集料金の設定、料金徴収方法、ディポジット制及び民間セクターへのライセンス料の整備の検討など、廃棄物管理事業体運営にかかわる財務計画を策定する。

4) 概算事業費積算

組織・制度・人材育成計画及び施設計画にかかる概算事業費を積算する。

(エ) 評価

1) 環境影響評価結果の取りまとめ

補足基礎調査で実施した環境影響評価の結果を取りまとめる。

2) 総合評価

プロジェクトの技術的、財務的、環境的、管理運用的な妥当性を確認するとともに、社会的・経済的な効果について評価を行う。

(オ) 実施計画

1) 実施計画

優先プロジェクトに関して、実施計画を策定する。

## 6. 4 調査工程

本件調査の期間及び工程は、S/W に示したスケジュールに従い、全体で 15 ヶ月とする。

## 6. 5 報告書

S/W に示したとおり、本件調査では以下の報告書をケニア側に提出する。

(1) インセプション・レポート	20 部
(2) プロGRESS・レポート (1)	20 部
(3) インテリム・レポート	20 部
(4) プロGRESS・レポート (2)	20 部
(5) ドラフトファイナル・レポート	20 部
(6) ファイナル・レポート	50 部

## 6.6 調査実施体制

本件調査におけるケニア側カウンターパート機関はナイロビ市環境部であるが、地方自治省都市計画部がこのカウンターパート機関を調整し、かつ関係機関（等）から構成されるステアリング・コミッティを設立し、本件調査の全体的な運営、政策的な事項について協議を行う。また、S/W におけるアンダーテイキングに関しては、大蔵省の管轄にある。

## 6.7 要員計画案

本件調査はナイロビ市の廃棄物管理計画を、ごみ収集・運搬・処分にかかる資機材計画およびそれらのメンテナンス計画、および廃棄物最終処分場計画等のハード面と、廃棄物収集料金の設置などの財政基盤のための方策作りや事業体の組織・運営、廃棄物にかかわる法制度の整備、環境／衛生教育、廃棄物処理の住民参加の普及、民間セクターの育成といったソフト面の両面を考慮することが、実現性のある計画を策定する上で不可欠である。したがって、総括を担当する団員は、廃棄物の技術面のみならず運営管理や法制度に対する知識、経験を有することが望ましい。また、調査団員の構成に関しても、廃棄物にかかる技術分野の団員と、経営・財務、組織・法制度、衛生教育、住民参加／廃棄物再利用などの分野の団員をバランスよく配置することが必要である。団員の主要な分野構成は次のとおりである。

- (1) 総括／廃棄物管理計画
- (2) 組織・法制度
- (3) 収集・運搬
- (4) ごみ分析
- (5) 最終処分/環境影響評価
- (6) 廃棄物再利用計画
- (7) 施設設計・積算
- (8) 経営・財務計画
- (9) 住民啓発/社会配慮
- (10) 人材育成計画

## 6.8 調査実施に必要な資機材

本格調査団に対するケニア側の便宜供与事項は S/W の通りである。その他本格調査に必要な資機材としては、以下のものが上げられる。

- (1) コピーマシーン

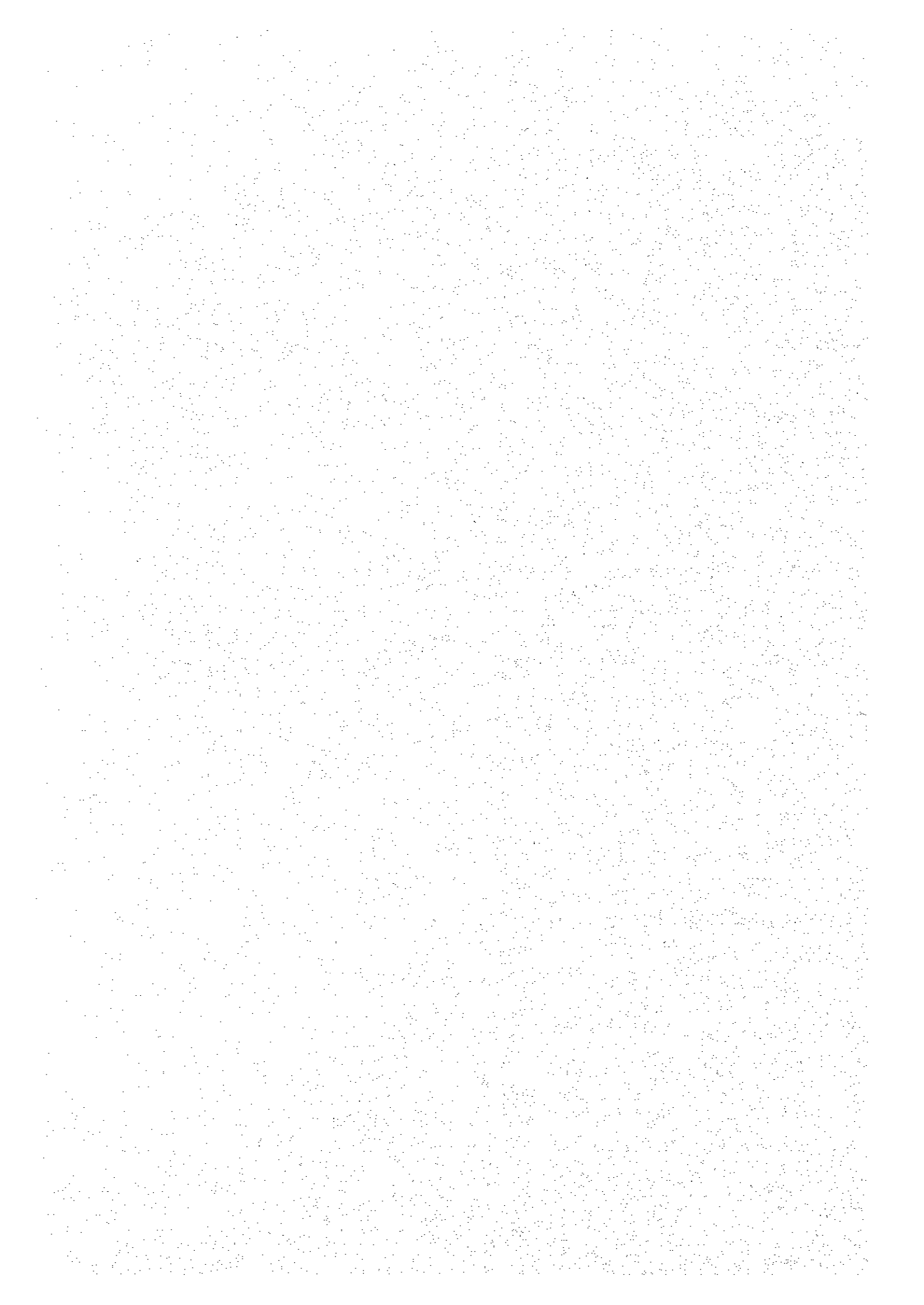




## 附 属 资 料



① ケニア国からの要請書



TERMS OF REFERENCE  
FOR  
MASTER PLAN STUDY  
FOR  
IMPROVEMENT OF SANITARY CONDITION  
OF  
URBAN AREA OF NAIROBI CITY  
IN KENYA

DECEMBER, 1993

NAIROBI CITY COUNCIL  
MINISTRY OF LOCAL GOVERNMENT  
GOVERNMENT OF REPUBLIC OF KENYA

TERMS OF REFERENCE FOR IMPROVEMENT OF SANITARY CONDITION OF  
URBAN AREA OF NAIROBI CITY IN KENYA.

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## 1. Introduction.

The city of Nairobi as the capital of Kenya and centre of industrial and commercial activities of the country has been expanding its urban area and population quite rapidly.

Under the circumstances, the Nairobi City Council has made some tremendous improvement in raising the standard of living conditions of its citizens such as in water and Sewerage systems gradually under a master plan done by the World Bank.

Unfortunately, in the field of refuse handling the city does not have any master plan. The city cannot do much on its own to make much improvement in this field. As a result, the sanitary condition in the urban area of Nairobi is extremely bad due to uncollected refuse.

So the Nairobi City Council intend to receive technical assistance from Japan for a Master Plan Study, in which certain proposals will be proposed to help solve the problem of such bad sanitary condition of the city.

## 2. Background Information

### 2.1 Natural Conditions

Nairobi is located on 36° 50' E in longitude and 1° 17' in latitude, that is 140 Kms South of the Equator, 500 Kms from the coast of Indian Ocean.

Even though it is located near the Equator, Climatic conditions are mild due to its height of 1660 m. from the sea level.

There are two rainy seasons. The long rains occur in March to May and the short rains from the end of October till the middle of December.

Annual precipitation is about 1,000 mm, a half of it comes within the rain period and a quarter of it comes within the short rains period.

Temperature rises to 28°C in daytime in March and drops to 12°C in Night of July. Average temperature during the year is about 18°C.

## 2.2 Urbanization of Nairobi.

Urbanization of Nairobi started late in the 19th century and had been developed as a key town of transportation between Indian Ocean and Lake Victoria. Nairobi became the capital of the Republic of Kenya on the country's independence in 1963. Since then it has been expanding rapidly as a centre of Political, Industrial and Commercial activities in Kenya.

Population of Nairobi by National census in 1980 and 1985 were 840,000 and 1,162,000 respectively, Population continues to grow by the same level and the present population (1993) is presumed to be about 2 millions.

## 2.3 Refuse Handling System

The estimated refuse generation in the Nairobi urban area is 930 tons/day. Of this refuse, only 400 tons are collected by City Council and Private Sectors.

The City Council is trying to increase the amount of refuse collected but due to lack of refuse collection vehicles and a poor maintenance system this has not been possible. The Council would like to establish a steady and adequate management strategy, but this is impossible without fixed enforcement programme of equipments and personnel.

As a result, uncollected refuse is found in most areas of the city including town centre and estates. This situation does not only result in unfavourable sanitary conditions but also unstable mental condition of inhabitants. Further to this, collected refuse is disposed by insufficient means from point of view of secondary pollution.



3. Objectives of the study.

The objectives of the study are as follows:-

1. To confirm present situation of refuse collection.
2. To decide necessary collection equipments for urgent aspect and up to year 2020.
3. To look for and to decide on a land fill site capable of handling City's wastes up to year 2020.
4. To decide on necessary land fill equipment.
5. To look into and advise on the establishment of the appropriate management organization.
6. To look into and advise on the establishment of the necessary maintenance organization.
7. To decide on the necessary maintenance equipment.
8. To study and analyse the present organisation system and advice on what is appropriate for the future.

4. Study Area

Whole urban area of the city of Nairobi is the study area.

5. Scope of the study.

Collection of the Existing Data.

- Socio-Economics
- Population
- Industry
- Agriculture
- Development Scheme
- Living Conditions
- Basic Human needs

- Refuse Generation Volume.  
Refuse volume in area-wise.  
Refuse Volume in resource-wise  
(Domestic, Industrial, Commercial, Medical etc.).
  - Characteristics of Refuse.
  - Existing facilities  
Collection equipments.  
Land Filling equipments  
Maintenance equipments.
  - Environment.  
Natural Environment  
Social environment  
Law and regulations  
Procedure of Environmental impact and  
Assessment (EIA).
  - Present Management, Operational and Maintenance System.
2. Socio-Economic Study
    - Refuse generation projection  
(Area-wise and generation resource-wise)
  3. Geographical Study
    - Study for Street condition for collection.
    - Study for possible sites for disposal.
    - study for possible sites for maintenance
  4. Field Reconnaissance.

5. Institutional Study.
  - study for Management System.
  - study for operational system.
  - study for maintenance system.
6. Formulation of Refuse Handling Master Plan.
  - Master Plan Formulation of Refuse Collection and Disposal in 1995, 2005 and 2020.
  - Master Plan Formulation for Institutional Framework for Refuse Handling.
  - Master Plan Formulation for maintenance system.
  - Preliminary cost estimation.
7. Evaluation of the Master Plan.
  - Preliminary cost/benefit examination on the master plan.
  - Environmental examination on the master plan regarding both social and natural aspects.
8. Recommendation of Method for materialization of Master Plan.
  - Determination of priority.
  - Cost Examination correspond to each priority.

#### 6. Study Period

Study will be completed 12 months after the commencement of the study.

Regarding detail schedule of study, please refer to Article 9 of this T.O.R. (Reports).

7. Expertise Required.

The study will require experts in the following fields:-

<u>Classification of Expert</u>	<u>Man - months</u>
1. Team leader (Waste Management)	12
2. Sanitary Engineer (Waste Management)	11
3. Mechanical Engineer (Vehicles/construction machine)	8
4. Mechanical Engineer (Workshop)	6
5. Environment Expert	6
6. Organization and Administration Expert	11
7. Economic and Financial Expert	6
Total	<u>60</u>

8. Technology Transfer and Training Programme.

Throughout the study period, technology transfer to the Nairobi City Council personnel from the study team is considered most desirable.

In order to enhance this and satisfactory completion of the study, the Council will assign the following personnel as a counterpart group to the study team.

Council counterpart Group.

Classification of Expert.

1. Project Director.
2. Sanitary Engineer.
3. City Planner
4. Mechanical Engineer.
5. Environment Expert.
6. Senior Administrative Officer.
7. Senior Accountant.

A training programme for counterpart personnel will be carried out.

Fellowship for about two man-months is required in the home country of the consultant and in other places where subjects, involved are available (including consultant's office, universities and other institutions). A series of lectures to enhance the knowledge and practical experience regarding water supply engineering and related fields are recommended.

9. Reports.

The following reports shall be submitted to Nairobi City Council:-

1. Inception Report

An Inception Report (20 copies) shall be submitted one month after the commencement of the study. This report shall clarify the work to be carried out. It shall present the main work plan for the study and outline the programme for the investigation and survey.

2. Progress Report

Progress Report (20 copies) shall be submitted after 3 months from the commencement of the study, at the end of the first on site work in Kenya. It shall contain the description of activities performed and the nature of data obtained during the first on site work.

3. Interim Report

Interim Report (20 copies) shall be submitted 6 months after the commencement of the study at the beginning of the second on-site work.

This report shall contain the outcome of the first home work in Japan and outline the Master Plan study.

4. Draft Final Report.

Draft Final Report (20 copies) shall be submitted 10 months after the commencement of the study.

5. Final Report.

Final report (50 copies) shall be submitted at the conclusion of the services, not later than 12 months after the commencement of the study.

Tentative Work Schedule

Month Description	1	2	3	4	5	6	7	8	9	10	11	12
Work in Kenya												
Work in Japan												
Report Presentation	△ I/R			△ P/R			△ IT/R			△ DF/F	△ DF/F	△ F/R

Note: IC/R : Inception Report

DF/R : Draft Final Report

P/R : Progress Report

F/R : Final Report

IT/R : Interim Report

10. UNDERTAKINGS OF THE GOVERNMENT OF KENYA

In order to facilitate the smooth and efficient conduct of the study, the Government of Kenya will undertake the following:-

1. To secure the safety of the study team.
2. To permit the members of the study team to enter, leave and sorjon in Kenya in connection with their assignments therein and exeapt them from alien registration requireme and consular fees.
3. To exempt the study team from taxes, duties and any other charges on equipment, machinery and other materials brought into and out of Kenya for the conduct of the stud;
4. To exempt the study team from income tax and charges of any kind imposed on or in connection with any emoluments or allowances paid to the members of the study team for their services in connection with the implementation of the study.
5. To provide necessary facilities to the study team for remittance as well as utilisation of the funds introduced in Kenya from Japan in connection with the implementation of the study.
6. To secure permission for entry into private properties or restricted areas for the conduct of the study.
7. To secure permission for the study team to take all data, documents and necessary materials related to the study ou of Kenya to Japan.
8. To provide medical services as needed. Its expenses will be charged to members of the study team.
9. To provide available maps, data, reports and other materi: relevant to the study.
10. To provide counterpart personnel and support staff for the study.
11. To provide vehicles for the study team and counterpart personnel.

12. To provide office space for the study team along with standard furniture and fixtures as well as stationery, in the study area, including maintenance and office running costs.
13. To provide supplementary work facilities for laboratory analysis and other investigations and surveys as may be needed by the study team.



TERMS OF REFERENCE

FOR

MASTER PLAN STUDY

FOR

IMPROVEMENT OF SOLID WASTE MANAGEMENT

FOR

URBAN AREA OF NAIROBI CITY

IN KENYA

AUGUST, 1996

NAIROBI CITY COUNCIL

MINISTRY OF LOCAL GOVERNMENT

GOVERNMENT OF THE REPUBLIC OF KENYA

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## 1. Introduction

Nairobi is the administrative capital of Kenya and the commercial, political and industrial centre of the country. It is also a major regional and international communication centre.

Nairobi City Council has made some tremendous improvements in the water supply and sewerage systems for Nairobi under a master plan done by the World Bank. Unfortunately in the field of solid waste management the city does not have any master plan. As a result, the state of sanitary conditions in the urban area of Nairobi is extremely bad due to uncollected waste. The lack of a detailed study and a master plan to deal with the nature and magnitude of solid waste generated in Nairobi city has hindered decisive action and effective management of the solid waste.

Following a series of discussions between the Embassy of Japan and Nairobi City Council, the council expects to receive technical and financial assistance from the Government of Japan to carry out a Master Plan Study and make proposals to help solve the problem of solid waste management in the City.

## 2. Background Information

### 2.1 Natural Conditions

Nairobi is located on 36 degrees 50' East in longitude and 1 degree 17' in latitude and is 140 km south of the equator and 500km inland to the west of the Indian Ocean.

Though located near the equator, climatic conditions are mild throughout the year because of the altitude above sea level which is 1,660 meters.

There are two rainy seasons - long rains in April, May and short rains in November and December, with an annual rainfall of over 1,000mm. Temperatures are moderate averaging 24 degrees centigrade during the hot months and night temperatures of 12 degrees centigrade during the cold months. Presently the city occupies an area of 684 sq.km.

## 2.2 Urbanization of Nairobi

Nairobi has experienced a rapid population growth since its inception. According to the national census of 1979 and 1989, the population increased from 840,000 to 1,162,000. Currently it is estimated to be above 2,200,000 growing at the rate of 7% per annum, largely due to rural urban migration, but also due to natural rate of increase.

The population of Nairobi increases during the day because of the many people who commute from the surrounding areas to come to work and do business.

## 2.3 Solid Waste Management Problem

Over the last decade Nairobi has seen a rapid deterioration in the provision of services to its residents. In the area of solid waste management the city is witnessing an almost complete breakdown in the waste collection. Piles of uncollected waste are everywhere even in the city centre.

While there is limited refuse collection in the central business districts of the city, in most residential areas there is complete lack of solid waste collection.

The uncollected refuse causes, not only bad sanitary condition but also health risks to the inhabitants. Further, collected refuse are disposed by insufficient means from view point of secondary pollution.

By law the Nairobi City Council (NCC) has the responsibility for the management of all solid waste in Nairobi. Within the NCC the immediate responsibility for waste management falls under the medical officer of health department. However, solid waste management will now be under the proposed Environment Department.

Available statistics indicate that about 1,000 tons of refuse is generated in the city daily and that only 400 tons are collected by the Nairobi City Council. It is projected that the central business district only will be generating 6,000 tons by the year 2000.

Solid waste management in the city of Nairobi suffers from many problems. In summary these include:-

-Lack of collection vehicles

- Uncontrolled urbanization
- Insufficient public education
- Limited community participation
- Insufficient trained human resources
- Lack of resource recovery mechanism
- Weak financial base
- Institutional weakness of city solid waste management
- Insufficient physical resources
- Lack of equipment maintenance programme
- Application of technically and economically inappropriate technology
- Lack of short-term, medium-term and long-term waste management planning

The proposed Master Plan Study will provide the Nairobi City Council with a comprehensive plan and action programmes for dealing with increased volume of solid waste in the City.

### 3. Study Area

Whole urban area of Nairobi

### 4. General Objectives of the Study

- 4.1 To confirm the present situation of the solid waste management (situation analysis).
- 4.2 To determine the required transport and waste collection equipment to respond to the urgent/immediate need and up to the year 2020.
- 4.3 To look for and decide on land fill sites capable of handling city's waste up to the year 2020.
- 4.4 To decide on the sizes, types, design and number of necessary land fill equipment.
- 4.5 To look into and advise on the establishment of the appropriate management organization.
- 4.6 To look into and advise on the establishment of the necessary maintenance

organization.

- 4.7 To decide on the necessary maintenance equipment and maintenance workshops.
- 4.8 To study and analyse the present organization system for solid waste management and advise on what is appropriate for the future.
- 4.9 To look into financial and economic requirements for sustainable solid waste management in Nairobi City.
- 4.10 To assess and determine the social dimension of solid waste management including: collection, treatment, and dumping among Nairobi residents.
- 4.11 To investigate the legal framework for improvement of solid waste management in the city.
- 4.12 To determine the health and environmental impact of improved solid waste management in the city.
- 4.13 To advise, recommend and design the installation of an efficient communication and information network to cater for solid waste management system up to the year 2020.
- 4.14 To determine the overall costs and benefits associated with proposed solid waste management organization.

## 5. Study Period

The Study will be completed in 12 months after commencement of the study.

## 6. Specific Objectives

Activities to be performed within each objective.

- 6.1 To confirm the present situation of the solid waste management (situation analysis)
  - a) Restructure the city into manageable units (40 - 45 areas)
  - b) Review the existing reports on solid waste management
  - c) Review the existing organization structure at City Hall including;

- staff policy and recruitment
  - human resources
  - manpower capacity
  - legal framework
  - backup services
- d) Evaluate the physical facilities for solid waste management.
- e) Assess the current equipment situation
- f) Carry out demographic survey of both controlled and uncontrolled human settlements
- g) Review current equipment and their operations
- Assessment of the current equipment situation in regards to:
    - Inventory
    - Running conditions
    - Maintenance programmes
    - Spare parts and acquisition methodology
    - Suitability
  - Assessment and compilation of:
    - Time schedules of the vehicles (starting time, loading points, travelling time to land fill site, off loading at landfill site and return journey.)
    - Time schedules for driver and operators
    - Route Maps
  - Work study of the operation of the plant, equipment and personnel to determine the required future inventory.
- h) Review procurement procedures
- i) Assess financial resources
- j) Determine the volumes and types (Domestic, Industrial, Commercial, Medical etc.) of waste generated in the city
- k) Assess the current manpower situation taking into consideration training, education, technical capacities, and cadre e.g. working gangs, street sweepers etc.
- l) Investigate the current dumping sites both public and private controlled and uncontrolled and their sustainability.
- m) Investigate who are the current players in waste generation, collection and disposal both formal and informal.
- n) Investigate current health and environment status in relation to sanitary conditions.
- o) Examine the current legal framework related to solid waste management.
- p) Investigate historical, social, cultural, political and economic development of solid waste management in the city.
- q) Establish the current information and communication network at Nairobi City Council related to solid waste management.

- ✓ r) Evaluation of the number and locations of the existing maintenance workshops to establish the need for new facilities or otherwise including:
  - Visiting of existing workshops to review the facilities and obtain first hand information on the strengths and weaknesses of the current systems and procedures.
  - Inspection of the available documents such as inventory cards, equipments, tools history, cards etc.
  - Carrying out of a physical survey of the existing workshops to establish the types, numbers and condition of the existing facilities.
  - Review of existing capacity of the workshops in solid waste management.
  - Review of procurement of goods and services
  - Assess and determine the adequacy of the distribution of existing equipment and tools to various sections.
  - Review of maintenance procedures both in-house and contracted.
  - Review of training policy of maintenance technicians.
  - Review of existing disposal procedures.
  - Review policy on replacement and procurement of maintenance equipment and tools.
  - Review existing information systems (hardware and software) for workshops.
- ✓ s) Assess the existing maintenance organization.
- ✓ t) Assess existing management and operational organization system for solid waste management.

**6.2 To determine the required transport and waste collection equipment to respond to the urgent/immediate need and up to the year 2020**

- a) Determine the equipment required for immediate action.
- b) Evaluate the present equipment requirement taking into account the future demand of the equipment based on: population, waste generation projections, affordability, durability, standardization, maintenance, sustainability, appropriateness and project these to the year 2020.
- c) Work study of the operation of the plant, equipment and personnel to determine the required future inventory. The study will involve:
  - ✓ - Systematic recording, analysis and critical examination of the existing and proposed ways of waste collection and dumping in order to develop and apply easier and more effective methods
  - Work measurement to establish the work content of the tasks by determining the time required for carrying it out at a defined standard of performance by a qualified worker.
- d) Establish criteria for equipment selection



Life cycle costing for equipment selection and maintenance programme by comparative costs taking into account the following:

- Initial capital costs
  - Operational costs
  - Planned maintenance costs (recurring costs per year)
  - Anticipated replacement costs (periodic costs)
  - Residual and salvage value
  - Economic life cycle in years
- e) Recommendation of suitable equipment for waste collection and disposal for urgent/immediate need and up to the year 2020.
- f) Assess the present and future maintenance requirements taking into consideration equipment, personnel, spare parts, workshops etc.
- g) Assess the suitability and design of waste collection equipment taking into account operation, maintenance, replacement and other alternative systems.
- h) Assess the training needs of personnel who can maintain the equipment now and in the future.

**6.3 To look for and decide on land fill sites capable of handling city's waste up to the year 2020.**

- a) Identification of suitable land fill sites considering, security, pollution, geological structure etc.
- b) Identify legal and public awareness measures to be taken for land fill site acquisition.
- c) Assess the health and environmental impact of Dandora dumping site.
- d) Determine the cost of land acquisition.
- e) Establish and design the necessary infrastructure and physical facilities for the land fill site (access roads, offices, services, security, communication etc.)
- f) Propose proper management of dumping site including recycling, sorting and scavenging control.
- g) Prepare designs for sanitary land fills.
- h) Propose measures to be taken to improve public and environmental health of scavengers, workers, visitors and the communities living near or around the land fill sites.
- l) Assess the socio-economic impact of the land fill site.
- j) Assess existing land fills and abandoned ones and propose rehabilitation measures.

**6.4 To decide on the sizes, types, design and number of necessary land fill equipment.**

- a) Identify and establish the needs and magnitudes of equipment and accessories (compactors, compactor bins, multi-loaders, containers for loader, cesspit emptier:

tipper trucks, bulldozers, land fill compactors, hydraulic excavators, wheel loaders, dumping trucks, mobile workshop, stationed workshop, incinerators, pick-ups, jeeps, micro-buses, spare parts, etc.)

- b) Diversified selection of equipment embracing efficiency and sustainable technology.
- c) Design training programmes for personnel to maintain and manage the equipment.

**6.5 To look into and advise on the establishment of the appropriate management organization.**

- a) Assess and determine the adequacy of the existing organization chart/structure of the cleansing section and make necessary recommendations to improve efficiency and cost effectiveness of the section.
- b) Assess and make recommendations on the establishment of monitoring and evaluation units.
- c) Assess and determine the manpower adequacy in the cleansing section in terms of qualifications, numbers, various skills, (technical management, administration, maintenance, etc.) and recommend the necessary amendments to improve efficiency and cost effectiveness of the section.
- c) Explore the possibility of establishing an independent environment department within the City Council overall organization structure/chart to improve efficiency and cost effectiveness of solid waste management.
- d) Establish and recommend the role of community participation.
- e) Assess the effectiveness of decentralization of solid waste management to enable community participation.

**6.6 To look into and advise on the establishment of the necessary maintenance organization.**

- a) Assess and determine the adequacy of the necessary maintenance organization.
- b) Recommend on improvement of efficiency and cost effectiveness of the maintenance organization including staff recruitment policy and training.
- c) Assess and determine the manpower needs/adequacy in the maintenance organization taking into consideration technical competency, maintenance skills, management qualifications, and recommend necessary changes to improve cost effectiveness of maintenance organization.
- d) Explore the possibility of decentralizing maintenance organization to improve efficiency and cost effectiveness.

**6.7 To decide on the necessary maintenance equipment and maintenance workshops.**

- a) Determine suitable maintenance systems for the machines, tools and engineering system.
- b) Determine the quantity of machines and tools required in each area of the workshops.
- c) Determine cost projection for both operation and development up to the year 2020.
- d) Design new workshops and identify land for construction of the workshops
- e) Prepare list of the required machines and tools for each area indicating those to be replaced or otherwise and provide the associated engineering systems of the machines and tools.
- f) Prepare cost estimates of the required machines and tools for each area and including their associated engineering systems.
- g) Prepare proposals of suitable maintenance system for machines, tools and engineering systems.
- h) Assess and recommend methods and procedures for procurement of equipment, spare parts and tools.
- i) Assess and advise on the safety measures in the maintenance workshops.
- j) Assess and determine the manpower needs/adequacy taking into consideration competency, relevant skills, remuneration, job description, qualification, as they relate to maintenance equipment.
- k) Explore the possibility of decentralizing maintenance of equipment within the City Council in order to cut down costs and improve efficiency.

**6.8 To study and analyse the present organization system for solid waste management and advise on what is appropriate for the future.**

- a) Review activities of the existing organization and where inadequacies exist recommend the necessary action to be taken to improve the situation.
- b) Review comprehensively the existing equipment and where inadequacies exist recommend the necessary action to be taken to improve efficiency and cost effectiveness.
- c) Review comprehensively the existing manpower and where inadequacies exist recommend the action to be taken.
- d) Review comprehensively the finance, maintenance, infrastructure, management, land fill sites, organization structure, etc. and where inadequacies exist recommend the appropriate action to be taken to improve efficiency and cost effectiveness.

**6.9 To look into financial and economic requirements for sustainable solid waste management in Nairobi City.**

- a) Assess and determine the financial requirements for solid waste management activities now and in the future and how they relate to council budget.
- b) Determine the manpower requirements for revenue collection and necessary organization structure.
- c) Explore and determine the infrastructure needed to be set to put environment department on sound financial base.
- d) Explore the various ways and means of raising and managing revenue to finance solid waste management.
- e) Explore the possibility of recycling waste as a profit making venture.
- g) Explore the possibility of setting up incineration services as a profit making venture.
- h) Explore the possibility of processing solid waste after collection as a source of revenue for the department.
- i) Assess the cost of implementation of the project and maintenance cost.

**6.10 To assess and determine the social dimension of solid waste management including: collection, treatment, and dumping among Nairobi residents.**

- a) Explore the attitude of Nairobi residents and institutional behaviour towards waste generation and dumping taking into consideration, regions, incomes, economic activities, (formal and informal), cultural patterns, education, religion, self employed, unemployed and under-employed.
- b) Explore the role of scavengers as a social-economic force in management of refuse collection and recycling.
- c) Explore the possibility of recycling waste using small and affordable technologies to enable more public participation.
- d) Explore how scavengers' role can be enhanced to increase their incomes and contribute more to social welfare of Nairobi residents.
- e) Assess the potential of waste recycling and how it can contribute to social welfare of Nairobi residents.
- f) Identify other players in solid waste collection, treatment and dumping and how their enhancement can contribute to social welfare of Nairobi residents.

**6.11 To investigate the legal framework for improvement of solid waste management in the city.**

- a) Study relevant legislation in regards to solid waste management with a view to making appropriate inclusion of new rules, by-laws, and/or regulations taking into

account: The Local Government Act, Public Health Act, Science and Technology Act, Food, Drugs and Chemical Substance Act, Local Authorities Service Charge Act, Land Laws possible introduction of Compliance Certificate, Pest Control Product Act, Traffic Act, Trade Licensing Act, Trading in Prohibited Goods Act etc.

- b) Study relevant checks and controls related to generation, collection haulage and disposal of waste, control on its use and recycling.
- c) Review penalties for those who pollute the environment and advise on both preventive and punitive measures to improve solid waste management up to the year 2020.
- d) Study international conventions/instruments relating to solid waste management, inspection regulation and advise on their sustainable implementation in Nairobi.
- e) Review the appropriate law enforcement to improve solid waste management.
- f) Investigate the need for environmental legislation and make recommendations.

**6.12 To determine the health and environmental impact of improved solid waste management in the city.**

- a) Make an appraisal of Nairobi City Council practices in solid waste management taking into account health, environmental aesthetic criteria etc.
- b) Establish the disease/morbidity/mortality patterns associated with poor solid waste management (assess hand collection methods, insects breeding, particulate inhalation, and study the food chain to ascertain presence of heavy-metals)
- c) Review existing environmental and public health knowledge, practice and attitude of the impact of improper handling of solid waste.
- d) Case study the effects of smoke, dust noise, ashes, and inflammable waste to the community exposed to solid waste dump sites.
- e) Investigate collection and disposal of medical waste from clinics, laboratories, chemists, industries and hospitals and make appropriate recommendations up to the year 2020.
- f) Investigate, experiment and do pilot demonstrations on waste disposal practices e.g. microbiological and chemical tests along Nairobi river, ground water contamination, and experiments on composting to determine pathogens present under certain temperatures.
- g) Determine the requirements for laboratory for testing and monitoring solid waste.
- h) Assess the possibility of establishing a testing and monitoring laboratory for solid waste management
- i) Determine the facilities and equipment for Laboratory for testing and monitoring of solid waste.

**6.13 To advise, recommend and design the installation of an efficient communication and information network to cater for solid waste management system up to the year 2020.**

- a) Assess and determine the existing communication and information systems of the cleansing section.
- b) Assess and determine the effective communication and information systems requirements for the solid waste management organization.
- c) Determine and recommend the necessary communication and information systems required by the cleansing department to handle voice, data and video.
- d) Determine communication network technology to support requirements for voice, data and video transmission up to the year 2020.
- e) Design the necessary information systems and communication network.
- g) Determine and recommend the necessary databases and application software for effective communication and management information systems for solid waste management.
- h) Determine and recommend the necessary hardware for running application software and databases access.
- I) Determine and recommend the necessary hardware and software for tracking and monitoring solid waste collection vehicles and effectiveness of waste collection routes and vehicles.
- j) Assess and recommend multi-media approach solutions to environmental and legal education through e.g. seminars, posters, drama, plays, films, television programmes, localized radio for the city only etc.
- k) Prepare documentary film on problems of solid waste management in Nairobi.
- l) Determine the communication and information system network plan up to the year 2020.
- m) Determine the communication and information network development policy up to the year 2020.
- n) Determine the cost of communication and information systems hardware and software and the benefits of the communication and information network in managing solid waste.
- o) Propose the necessary manpower and training programmes for the information systems and communication network operations.

**6.14 To determine the overall costs and benefits associated with proposed solid waste management organization.**

- a) Using the data from the study, determine the aggregate cost of all inputs for the project including land acquisition, infrastructure development, workshops, laboratory,

offices, machinery, equipment, software, vehicles, communication and information technology etc.

- b) Determine the annual operating costs separating them between fixed and variable costs and including monitoring and enforcement costs.
- c) Determine appropriate charge rates for collection and disposal of solid waste from various sites (e.g. homes, industries, hotels, hospitals etc.)
- d) Devise a suitable method for determining the rates at which private waste collectors would be paid for work done on behalf of the City Council.
- e) Using data collected in the study and any other relevant data, make an estimate, in monetary terms, of the benefits to be derived from the use of the proposed system of solid waste management.
- g) Compute an economic cost/benefit index using year 2020 as the end of the project's life and using a suitable national social discount rate.
- h) Establish the economic and financial viability of the project.
- i) Prepare a cost schedule summarizing costs to be incurred by the project up to the year 2020.
- j) Undertake a suitable sensitivity analysis so as to clearly identify areas where significant cost variations might be expected to occur.

## 7. Expertise Required.

The study will require experts in the following fields.

	Classification of Expert	Man-Months
7.1	Team Leader	36
7.2	Solid waste Expert	37
7.3	Mechanical Engineer (Plant and Equipment)	42
7.4	Environment Expert	70
7.5	Health Expert	54
7.6	Civil Engineer (Structural/Transportation/Sanitary Surveyor/Hydro-geologist)	100
7.7	Mechanical/Electrical Engineer (Workshops and Building Services)	35
7.8	Communication/Information Systems Engineer	45
7.9	Architect	77
7.10	Quantity Surveyor	60
7.11	Legal Expert	29
7.12	Management/Financial Consultant	27

- 7.13 Preparation of documentary film on solid waste management - cost USD 12,000
- 7.14 Laboratory tests and analysis related to physical composition of solid waste, analysis of soil, air, surface water and ground water quality, hazardous and toxic wastes from hospitals, clinics, industries and other sources - cost USD 60,000

## 8. Technology Transfer and Training Programme

Throughout the study period, technology transfer from the study team to the Nairobi City Council personnel and the local consultants is considered most desirable. In order to enhance this and satisfactory completion of the study, the Council will assign the following personnel as a counterpart group to the study team.

### Council Counterpart Group

#### Classification of Expert

- i) Project Director
- ii) Sanitary Engineer
- iii) City Planner
- iv) Mechanical Engineer
- v) Environment Expert
- vi) Senior Administrative Officer
- vii) Senior Accountant

A training programme for the counterpart personnel will be carried out. Fellowship for about two man-months is required in the home country of the consultant and in other places where subjects involved are available (including consultant's office, universities and other institutions). A series of lectures to enhance the knowledge and practical experience regarding solid waste management and related fields are recommended.

## 9. Reports

The following reports shall be submitted to Nairobi City Council (see work schedule - Appendix A)



i) Inception Report

An Inception Report (20 copies) shall be submitted one month after the commencement of the Study. This report will clarify the work to be carried out. It shall present the main work plan for the study and outline the programme for the investigation and survey.

ii) Progress Report

Progress Report (20 Copies) shall be submitted after 3 months from the commencement of the study, at the end of the first on-site work in Kenya. It shall contain the description of activities performed and the nature of data obtained during the first on-site work.

iii) Interim Report

Interim Report (20 copies) shall be submitted 6 months after the commencement of the study, at the beginning of the second on-site work. This report shall contain the outcomes of the first home work in Japan, and outline the Master Plan Study.

iv) Draft Final Report

Draft Final Report (20 copies) shall be submitted 10 months after the commencement of the study.

v) Final Report

Final Report (50 Copies) shall be submitted at the conclusion of the services, not later than 12 months after the commencement of the study.

**10. Undertakings of the Government of Kenya**

In order to facilitate the smooth and efficient conduct of the the study, the Government of Kenya will undertake the following.

- a) To secure the safety of the study team.
- b) To permit the members of the study team to enter, leave and sojourn in Kenya in connection with their assignments therein, and exempt them from alien registration requirements and consular fees.
- c) To exempt the study team from taxes, duties and any other charges on equipment.

- machinery and other materials brought into and out of Kenya for the conduct of the study.
- d) To exempt the study team from income tax and charges of any kind imposed on or in connection with any emoluments or allowances paid to the members of the study team for their services in connection with the implementation of the study.
  - e) To provide necessary facilities to the study team for remittance as well as utilization of the funds introduced in Kenya from Japan in connection with the implementation of the study.
  - f) To secure permission for entry into private properties or restricted areas for the conduct of the study.
  - g) To secure permission for the study team to take all data, documents and necessary materials related to the study out of Kenya to Japan.
  - h) To provide medical services as needed. Its expenses will be charged to members of the study team.
  - i) To provide available maps, data and reports and other materials relevant to the study.
  - j) To provide counterpart personnel and support staff for the study.
  - k) To provide vehicles for the study team and counterpart personnel.
  - l) To provide office space for the study team along with standard furniture and fixtures, as well as stationery, in the study area, including maintenance and office running costs.
  - m) To provide supplementary work facilities for laboratory analysis and other investigations and surveys as may be needed by the study team.

APPENDIX A

Tentative Work Schedule

Month Description	1	2	3	4	5	6	7	8	9	10	11	12
Work in Kenya												
Work in Japan												
Report Presentation												
	△	△	△	△	△	△	△	△	△	△	△	△
	I/R	I/R	P/R	P/R	P/R	P/R	IT/R	IT/R	DF/F	DF/F	DF/F	F/R

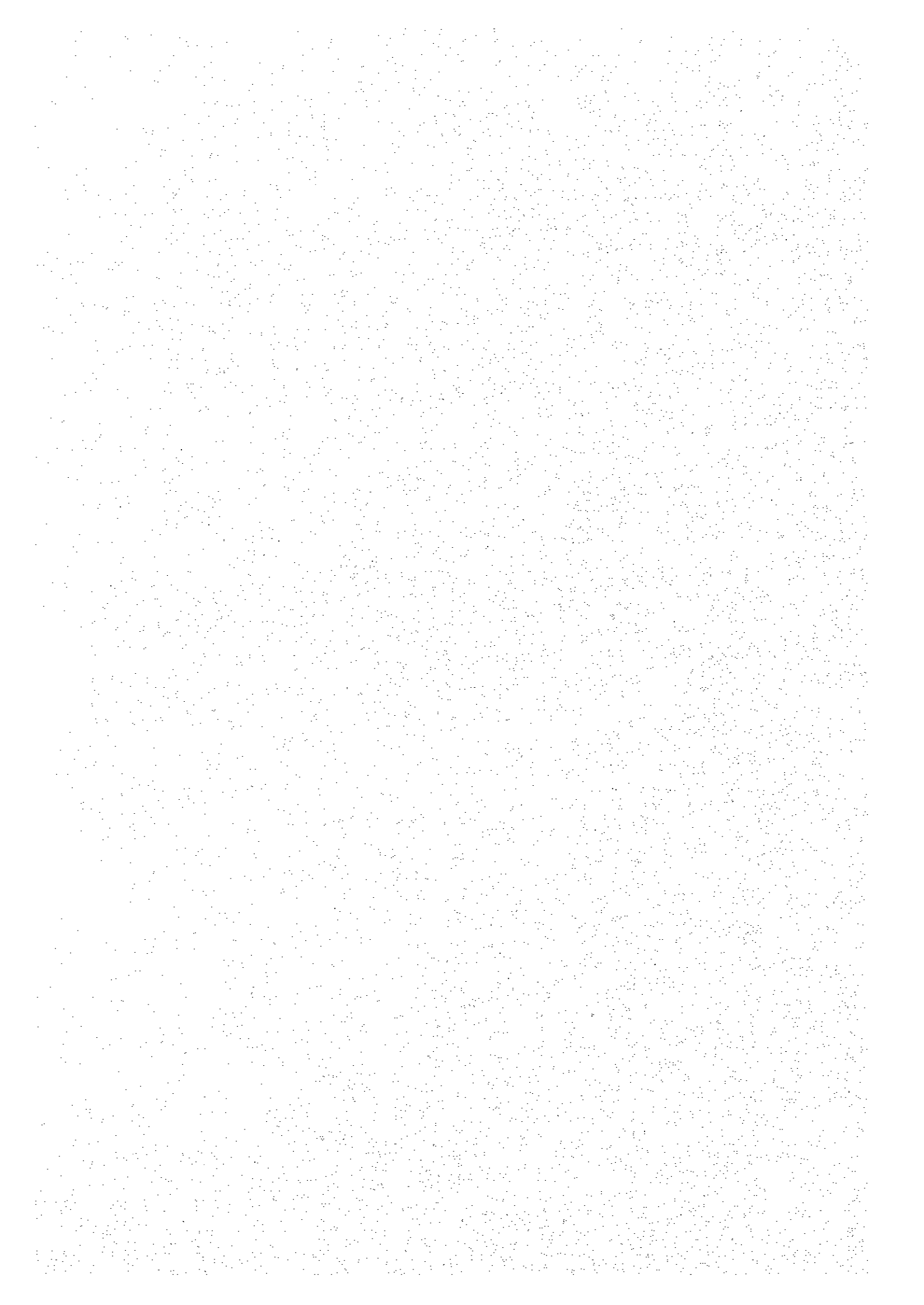
Note: IC/R : Inception Report                      DF/R : Draft Final Report

          P/R : Progress Report                      F/R : Final Report

          IT/R : Interim Report

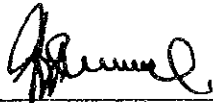


② S/W 及び M/M



SCOPE OF WORK  
FOR  
THE STUDY  
ON  
SOLID WASTE MANAGEMENT IN NAIROBI CITY  
IN  
THE REPUBLIC OF KENYA  
AGREED UPON BETWEEN  
THE MINISTRY OF LOCAL GOVERNMENT  
(NAIROBI CITY COUNCIL)  
AND  
JAPAN INTERNATIONAL COOPERATION AGENCY

Nairobi City, October 30, 1996



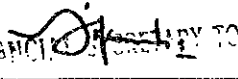
Mr. R.K.A. Siele EBS  
Permanent Secretary  
The Ministry of Local Government

Witnessed



Mr. H. Oluch  
Town Clerk  
The Nairobi City Council

Countersigned



FINANCIAL SECRETARY TO THE TREASURY  
Mr. J.K. Kinyua  
Financial Secretary  
The Ministry of Finance



Dr. Yuzo INOUE  
Leader, Preparatory Study Team,  
Japan International Cooperation  
Agency



## I. INTRODUCTION

In response to the request of the Government of the Republic of Kenya (hereinafter referred to as "Kenya"), the Government of Japan has decided to conduct A Study on Solid Waste Management in Nairobi City in the Republic of Kenya (hereinafter referred to as "the Study") in accordance with the relevant laws and regulations in force in Japan.

Accordingly, the Japan International Cooperation Agency (hereinafter referred to as "JICA"), the official agency responsible for the implementation of the technical cooperation programs of the Government of Japan, will undertake the Study in close cooperation with authorities concerned of the Government of Kenya.

The present document sets forth the Scope of Work with regard to the Study.

## II. OBJECTIVES OF THE STUDY

The objectives of the Study are:

1. to formulate a master plan for the improvement of solid waste management (hereinafter referred to as "SWM") in Nairobi City with emphasis on operational, institutional and administrative aspects for the target year 2008,
2. to conduct a feasibility study on the priority project(s) to be selected from the master plan, and
3. to transfer technologies for solid waste management to counterpart personnel in the course of the study.

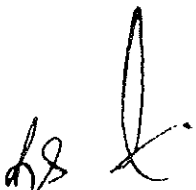
## III. STUDY AREA

The study shall cover the area of Nairobi City.

## IV. SCOPE OF THE STUDY

In order to achieve the above mentioned objectives, the Study shall cover the following:

Phase I: Master Plan



1





1. Collection and analysis of existing data and information of Nairobi City:
  - a) data and information on physical conditions such as climatic, topographic, meteorological, hydrological, soil, geological and geographical conditions
  - b) social and economic situations
  - c) city planning, urban development plans and land use plan related to the Study
  - d) legislation and regulations concerned with environment/ sanitation
  - e) financial situations
  - f) policy concerned with environment/ sanitation, and
  - g) other relevant plans
  
2. Understanding of the present conditions in Nairobi City, such as
  - a) implementation of SWM
  - b) operation and maintenance of equipment for SWM
  - c) recycling and reuse of solid wastes
  - d) health and hygiene of residents
  - e) institutional and administrative capacity
  - f) human resource development plan
  - g) environmental pollution, caused by solid wastes
  - h) activities by non-governmental organization(NGO), private companies and scavengers
  
3. Field survey:
  - a) amount of solid waste and its composition
  - b) time and motion
  - c) public awareness on SWM
  
4. Evaluation of present condition of SWM and identification of problems and issues with emphasis on:
  - a) relevant plans
  - b) environmental and hygiene aspects
  - c) financial aspects
  - d) operational and institutional aspects
  - e) legal aspects
  - f) socio-economic aspects
  - g) administrative aspects
  
5. Establishment of basic policies and frameworks, forecasting through projection on:
  - a) population growth and urbanization

- b) economic growth and changes in living conditions
  - c) changes in quality and quantity of solid wastes
  - d) operational and institutional aspects
  - e) administrative aspects
6. Establishment of basic plan, including:
- a) treatment and collection of solid waste
  - b) operation and institution strengthening
  - c) financial planning
  - d) legislation and regulation
7. Institutional and organization plans, including:
- a) human resource development plan
  - b) administration development plan
8. Facilities plan, including:
- a) preliminary design of facilities
  - b) preliminary equipment plan
9. Preliminary cost estimate
10. Comprehensive master plan evaluation, including:
- a) environmental and hygiene aspects
  - b) financial aspects
  - c) operational and institutional aspects
  - d) legal aspects
  - e) socio-economic aspects
  - f) administrative aspects
11. Staging implementation plan
12. Selection of priority project(s)
13. Selection of pilot study(ies)

#### Phase II: Feasibility-Study

- 1. Collection and review of existing supplementary data and information on Nairobi City
- 2. In-depth understanding of the present conditions in Nairobi City

3. In-depth field survey
4. Implementation of selected pilot study(ies)
5. Establishment of feasible specifications
6. Organization, institution and human resource development plans, including:
  - a) organizational structure
  - b) staffing and manpower development
  - c) private sector promotion
  - d) recycling systems
  - e) environmental education
  - f) residents participation
7. Feasible facilities plan, including:
  - a) equipment plan
  - b) construction plan
  - c) operation and maintenance plan
8. Financial plans, including:
  - a) tariff policy
  - b) expected financial sources for investment
  - c) expected financial sources for operation, maintenance and depreciation
9. Cost estimation, including:
  - a) human resource development cost
  - b) public education cost
  - c) construction and equipment cost
  - d) operation and maintenance cost
10. Conduct Environmental Impact Assessment(EIA)
11. Comprehensive project evaluation, including:
  - a) technical aspects(appropriate technology)
  - b) financial aspects
  - c) environmental aspects
  - d) socio-economic aspects
12. Implementation plan

LS



## V. STUDY SCHEDULE

The Study will be carried out in accordance with the tentative schedule attached in Annex 1.

## VI. REPORTS

JICA will prepare and submit the following reports in English to the Government of Kenya.

1. Inception Report:

Twenty (20) copies at the commencement of the first work in Kenya.

2. Progress Report (1):

Twenty (20) copies at the end of the first work in Kenya.

3. Interim Report:

Twenty (20) copies at the beginning of the second work in Kenya.

4. Progress Report (2):

Twenty (20) copies at the end of the second work in Kenya.

5. Draft Final Report:

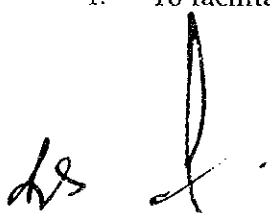
Twenty (20) copies at the beginning of the third work in Kenya. The Government of Kenya will submit its comments to JICA within one (1) month after receipt of the Draft Final Report.

6. Final Report

Fifty (50) copies within one(1)month after JICA receipt of comments on the Draft Final Report.

## VII. UNDERTAKINGS OF THE GOVERNMENT OF KENYA

1. To facilitate smooth conduct of the Study, the Government of Kenya shall take



1. To facilitate smooth conduct of the Study, the Government of Kenya shall take necessary measures as follows:

(1) to secure the safety of the Japanese Study Team (hereinafter referred to as "the Team").

(2) to permit the members of the Team to enter, leave and sojourn in Kenya for the duration of their assignment therein, and exempt them from foreign registration requirements and consular fees.

(3) to exempt the members of the Team from taxes, duties, fees and other charges on equipment, machinery and other materials brought into and out of Kenya for the conduct of the Study.

(4) to exempt the members of the Team from income tax and charges of any kind imposed on or in connection with any emoluments or allowances paid to the members of the Team for their services in connection with the implementation of the Study.

(5) to provide necessary facilities to the Team for remittance as well as utilization of the funds introduced into Kenya from Japan in connection with the implementation of the Study.



(6) to secure permission for entry into private properties or restricted areas for the implementation of the Study.

(7) to secure permission for the Team to take all data and documents ( including photographs and maps ) related to the Study out of Kenya to Japan, and

(8) to provide medical services as needed. Its expenses will be chargeable on members of the Team.

2. The Government of Kenya shall bear claims, if any arises, against the members of the Team resulting from, occurring in the course of, or otherwise connected with, the discharge of their duties in the implementation of the Study, except when such claims arise from gross negligence or willful misconduct on the part of the members of the Team.

3. Nairobi City Council and the Ministry of Local Government shall act as the counterpart agencies to the Team and also as coordinating bodies in relation with other governmental and non-governmental organizations concerned for the smooth implementation of the Study.



4. Nairobi City Council and the Ministry of Local Government shall, at its own expense, provide the Team with the following, in cooperation with other organizations concerned:

- (1) available data and information related to the Study,
- (2) counterpart personnel,
- (3) suitable office space with necessary equipment in Nairobi City,
- (4) appropriate number of vehicles with drivers, and
- (5) credentials or identification cards.

#### VIII. UNDERTAKINGS OF JICA


For the implementation of the Study, JICA shall take the following measures:

1. to dispatch, as its own expense, the Study Team to Kenya, and
2. to pursue technology transfer to the Kenya counterpart personnel in the course of the Study.

#### IX. CONSULTATION

JICA, Nairobi City Council and the Ministry of Local Government shall consult with each other in respect of any matter that may arise from or in connection with the Study.

hs



TENTATIVE SCHEDULE

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Work in Kenya	■			■		■		■		■		■		■		
Work in Japan	■			■			■			■			■		■	
Report	IC/R			PR/R <1>		IT/R			PR/R <2>					DF/R		F/R

IC/R: Inception Report  
 PR/R: Progress Report  
 IT/R: Interim Report  
 DF/R: Draft Final Report  
 F/R : Final Report

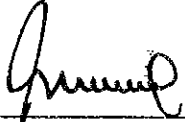
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MINUTES OF MEETING  
FOR  
THE STUDY  
ON  
SOLID WASTE MANAGEMENT IN NAIROBI CITY  
IN  
THE REPUBLIC OF KENYA  
AGREED UPON BETWEEN  
THE MINISTRY OF LOCAL GOVERNMENT  
(NAIROBI CITY COUNCIL)  
AND  
JAPAN INTERNATIONAL COOPERATION AGENCY

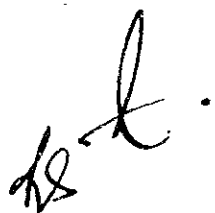
Nairobi, October 30, 1996

  
\_\_\_\_\_  
Mr. R.K.A. Siele EBS  
Permanent Secretary  
The Ministry of Local Government

  
\_\_\_\_\_  
Dr. Yuzo INOUE  
Leader, Preparatory Study Team,  
Japan International Cooperation  
Agency

Witnessed  
  
\_\_\_\_\_  
Mr. H.O. Njoch  
Town Clerk  
The Nairobi City Council

Countersigned  
  
\_\_\_\_\_  
FINANCIAL SECRETARY TO THE TREASURY  
Mr. J.K. Kinyua  
Financial Secretary  
The Ministry of Finance







Based on the official request from the Government of the Republic of Kenya, the Government of Japan, through the Japan International Cooperation Agency (JICA), has agreed to conduct a Study on Solid Waste Management in Nairobi City in the Republic of Kenya (hereinafter referred to as "the Study").

The JICA Preparatory Study Team (hereinafter referred to as "the Team"), headed by Dr. Yuzo INOUE, visited Kenya from 21st to 31st of October, 1996, where they held a series of meetings with the Ministry of Finance, the Ministry of Local Government, Nairobi City Council and other authorities concerned from the Government of The Republic of Kenya. The list of participants is shown in the Appendix I.

During the discussions, both sides agreed to the Scope of Work to be undertaken by the Ministry of Finance, the Ministry of Local Government, Nairobi City Council and JICA for successful execution of the Study. In addition to the Scope of Work, the Team and the Kenyan side confirmed and agreed on, among others, the following:

1) The title of the Study

Both the Team and Kenyan side agreed that the study will cover solid waste management. According to the agreement, title of the Study will be "The Study on Solid Waste Management in Nairobi City in The Republic of Kenya". Kenyan side requested the Study to look at sanitation situation of Nairobi river. The Team stated that sanitation of Nairobi river will not be included, because the Study is intended to concentrate on solid waste management.

2) The target year

Both sides agreed that due to the fact that the Study shall be finalized in 1998, target year of the ten-year master plan shall be 2008.

3) The study area

Both sides agreed that geographical area of the Study will be area under the jurisdiction of the Nairobi City Council. In the case that the proposed landfill site/s be out of Nairobi City, such site/s shall also be included in the study area.

4) The types of solid waste

Both sides agreed that types of solid waste to be studied will be limited to household waste, market waste, commercial waste, street sweeping waste and office waste. Kenyan side requested that industrial

and medical waste be included in the Study. The Team stated that the Study of industrial and medical waste will be limited only to policy suggestion in the Master Plan study.

5) The counterpart team

The Nairobi City Council will organize "Counterpart Team" which will cooperate with the Study Team. Member of the counterpart team shall consist, at least, of those who are responsible for the following fields:

- a) Administration of Solid Waste
- b) Collection of Solid Waste
- c) Disposal at Sanitary Landfill
- d) Policy and Administrative Planning for Solid Waste Management
- e) Implementation of the Said Planning
- f) Finance and Accounting
- g) Human Resource Development
- h) Legislation Related to Solid Waste Management
- i) Social Services

6) The steering committee

The Kenyan side shall organize "Steering Committee" which shall be empowered to make decisions and take responsibilities for the recommendations of the Study.

7) The proposed landfill site/s

Landfill site/s for final disposal will be decided in the Master Plan. In the case that the Feasibility Study shall include construction plan of such landfill site/s, Nairobi City Council shall be responsible for acquiring the site/s, obtaining consent of neighboring residents and clearing requirements of environmental impact assessment.

8) The important issue of the Study

It is the view of the Team and Nairobi City Council that strengthening of institutional framework of solid waste management is essential. Therefore, the Study shall concentrate on detailed steps to be taken to improve legal, administrative procedures, organizational setups, operation, maintenance and financial resources mobilization related to solid waste management.

9) Activities of the private sector, etc.

In view of the current situation where the private sector, NGOs and other parties working on betterment of sanitation in the City, the Study

will make due attention on the activities of these parties.

10) Pilot study

In accordance with the Scope of Work, details of a pilot study/ies will be formulated in Phase I: Master Plan, and it/they will be conducted in Phase II: Feasibility Study. The pilot study/ies will be intended to demonstrate effects of the improved operating capacity by experimenting a program/s proposed in the Master Plan. This experiment shall be undertaken primarily by utilizing the existing personnel and other resources of Nairobi City Council.

11) Available data and information, office and vehicles for the Study

The Team requested Kenyan side to provide available data and information, appropriate number of vehicles with drivers, a suitable office space with furniture, telephone and access to a facsimile machine for the team of the Study. Kenyan side confirmed the following equipment and facilities will be made available :

- a) At least one car with a driver
- b) Office space with furniture
- c) telephone services and access to a facsimile machine for local communication

Also, Kenyan side confirmed to make utmost effort to obtain available data and information.

12) Counterpart training



Kenyan side requested that the transfer of technology would be realized also through training in Japan. The Team will convey the request to the JICA Headquarters.

13) Collected data

Both sides agreed that data collected during the Study will be made available both parties.

14) The Study schedule

In view of the current critical sanitation situation of the city of Nairobi, Kenyan side requested that the Study schedule be reduced to probably 12 or 13 month. The Team will convey the request to the JICA Headquarters.



## Appendix I

### Attendance to the meeting

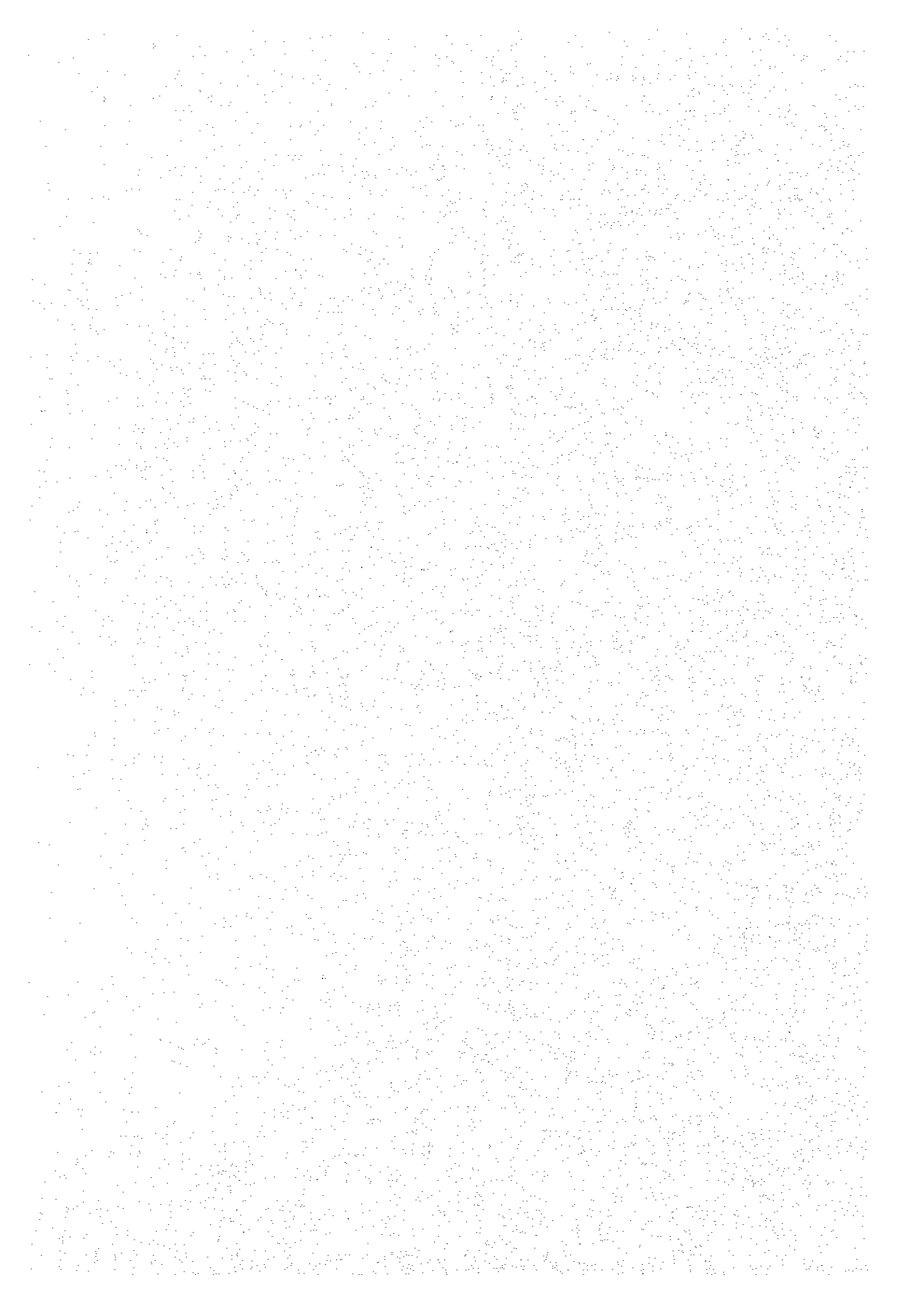
#### Kenyan side

Eng. F.J. Mulli,	Deputy Director of Urban Development, MOLG
Col. (Rtd) F.R. Nthiga	Director of Environment, NCC
Mr. J. Amaya	Senior planning Officer, Urban development, MOLG
Mr. S.W. Opiyo	Deputy Director of Environment, NCC
Mrs. M.M. Jobita	Deputy Director, HDD, NCC
Mr. J.M. Gachuhi	Cleansing Superintendent, NCC
Mr. J. Githua	Assistant Cleansing Superintendent, NCC
Mr P.M. Wamwiri	Deputy Cleansing Superintendent, NCC
Ms. Leah Oyake	Chemist, Department of Environment, NCC
Mr. John Njuguna	Incharge Prosecutions, NCC
Mr. W. Muhindi	Urban Development Sociologist, MOLG
Mr. S.G. Gichohi	Deputy City Engineer, NCC
Mr. John K. Barreh	City Planning and Architecture, NCC

#### Japanese Side

Dr. Yuzo Inoue	Leader, MOHW
Mr. Toshiya Sato	Study Planning, JICA
Mr. Hiromasa Minakami	Institution Consultant, JICA
Mr. Noboru Saeki	Collection and Transport Expert, JICA
Mr. Komei Kawauchi	Final Disposal/Environment Expert, JICA
Mr. Yoshiharu Yamada	Assistant Resident Representative, JICA Kenya Office

③ 質問状



QUESTIONNAIRE  
FOR  
THE STUDY  
ON  
THE SOLID WASTE MANAGEMENT  
FOR  
NAIROBI CITY  
IN  
THE REPUBLIC OF KENYA

submitted to:  
The Nairobi City Council

submitted by:  
Preparatory Study Team  
Japan International Cooperation Agency

October 1996

**QUESTIONNAIRE (I)**  
( General Aspects )

In order to understand the background and situation of solid waste management in Nairobi City, the Japan International Corporation Agency (JICA) Preparatory Study Team kindly request Nairobi City Council (NCC) to prepare the following data and information before the arrival of the team as possible.

**1. Planning Unit and Supervisory Committee**

Please introduce the section and members of the planning unit in the Nairobi City Council who planned and requested the execution of this master plan study.

Please inform members of the supervisory committee, if already organized, which consists of related authorities for decision making.

**2. Natural conditions of Nairobi City Area**

- 1) Topographical map
- 2) Geological map
- 3) River/canal map
- 4) Aerial photos
- 5) Meteorological data  
(Temperature, rainfall, wind and climate)

**3. Area conditions**

- 1) Present land use and future land use plan
- 2) Road conditions and future road construction
- 3) Housing conditions and future development
- 4) Status of water supply and sewerage system and future plan
- 5) Electric power supply condition

**4. Socio-Economic Conditions of Nairobi City Area**

- 1) Population  
(present status, population growth, situation of migration, and the future projection)
- 2) Population density map with administrative district division in the study area
- 3) Race and Religion
- 4) Economic conditions



-Main economic indicators (GDP, growth rate, consumer price inflation, current account balance, foreign debt, exchange rate etc.)

-Gross domestic product (agriculture production, government services, trade, manufacturing production, financing)

-Employment by industry and sector

- 5) Information on private companies, groups, communities, NGO's and the like who render solid waste collection or garbage disposal
- 6) Information on the public education, training, advocating activities on the public health and sanitation, the environmental conservation, or more particularly, handling of solid waste ever programmed and undertaken to the public, women, school children, etc. by the City Council or the National Government
- 7) Information and records, if any, on complaints, criticism, protests made by inhabitants, visitors and tourists regarding the City's garbage collecting activities or garbage piled up everywhere on streets
- 8) Records of speeches and discussions mentioning garbage in the City made by representatives in the State Parliament and/or in the Municipal Assembly

#### 5. Regional/Development Plans, Programs, and Projects

- 1) National Development plan
- 2) Long and middle term regional/development plans and projects in the study area

#### 6. Institutional information

- 1) Organization charts of the other ministries and authorities at national level, which are related to solid waste management, and more broadly to environmental issues in general
- 2) Organization chart of the Ministry of Local Government
- 3) Organization charts of the Nairobi City Council, the Public Health Department, the Medical Officer for Health, the Cleansing Section, the Town Clerk, the City Engineer, the General Manager of Water and Sewerage, the City Treasurer, the Director of City Inspectorate, the Department of Environment and other offices and officers related to solid waste management within Nairobi City
- 4) Funding laws, proclamations, regulations, articles of incorporation and other legal establishments which are related to the above organizations, offices, etc. Budgets and actual disbursement of these organizations, offices, etc.
- 5) Functions and activities of these organizations, offices, etc.

- 6) Details of personnel (including number, qualification, career- or class-wise classifications, promotion system, training or career upgrading programs) of these organizations, offices, etc.

**QUESTIONNAIRE (II)**  
( Environmental and Solid Waste Management Aspects )

1. Legislation and Regulations

- 1) National environment policies and action plan
  - a) Environment Law
  - b) Law/guidelines on environment impact assessment
  - c) Environmental quality standards
  - d) Environmental regulations (emission gas, effluent, etc.)
- 2) National SWM policies and action plan  
Laws, proclamations, regulations and other legal enforcement relating to the solid waste management and control
- 3) Privatization
- 4) Affiliation of international conventions  
Affiliation to bilateral or multilateral conventions concerning environmental conservation, e.g. Ramsar Convention, and Washington Convention

2. Present status of public health and environmental situation

- 1) Status of public health
  - a) Epidemic decease
  - b) Public awareness
- 2) Natural Environment
  - a) Species of valuable animals and plants in the area, if any.
  - b) History of natural disaster, such as landslide, earthquake, and flood
  - c) Location of particular areas officially protected such as national parks and natural parks
  - d) Distribution of important landscape or scenery for tourism or religion
- 3) Environmental Pollution
  - a) Air
  - b) Water
  - c) Soil contamination

3. Solid waste management system

- 1) Generation and Storage of Solid Waste
  - a) Generation of solid wastes ( by kg/capita,/day, ton/year, area, income )  
-Ordinary residential area (high, middle and low income)

- Spontaneous settlement
  - b) Generation amount by types of solid wastes  
( residential, commercial, industrial, medical wastes, etc.)
  - c) Composition of Solid Wastes  
( garbage, papers, plastics, cans, bottles, etc.)
  - d) Present situation of self disposal  
( composting, onsite burning )
  - e) Present situation of source separation
  - f) Activities of regional groups or organizations
- 2) Collection and transportation of Solid Wastes
- a) Service population, service area (ha) and service coverage rates
  - b) Collection method of household wastes  
( combined or separate, by own staff or contracts)  
-Ordinary residential area (high, middle and low income)  
-Spontaneous settlement
  - c) Collection method of medical wastes  
( separation, by own staff or contracts)
  - d) Collection method of commercial waste  
(separation, by own staff or contracts)
  - e) Collection method of other industrial method  
(separation, by own staff or contracts)
  - f) Collection frequency (days/week, times/day)
  - g) Collection amount by type of solid waste  
( residential, commercial, industrial, medical wastes, etc.)
  - h) Cost of collection and transportation
  - i) Collection charge  
( tariff, recovery rate, collection amount and method)
  - j) Collection container (bags or bins)
  - k) Collection vehicles  
(types, number and condition of collection vehicles, tractors, compactors etc.)
  - k) workshop for maintenance  
(size and capacity, present situation of operation)
  - l) Illegal dumping (location, quality and quantity)
  - m) Road sweeping (amount, sweeping area)
  - n) Transfer station

- (outline of the facility, size and capacity)
- o) Travel frequency  
(from collection area to treatment facility or disposal site)
- 3) Treatment and Disposal of Solid Wastes
- a) Intermediate treatment  
(method, location of facilities, surroundings, etc.)
  - b) Inventory and capacity of the existing dumping sites  
(location, area, surroundings etc.)
  - c) Construction and running cost of each dumping site
  - d) Inventory of prospective landfill sites for future use
  - e) History and present situation of public acceptance of the facilities
  - f) Disposal method  
(sanitary landfill or open dumping, soil coverage method, lining works)
  - g) Subgrade soil characteristics of final disposal site
  - h) Leachate treatment and influence by leachate
- 4) Recycling
- a) Recycled materials like papers, iron, and aluminum, and their selling prices
  - b) Resource recovery system  
(Private institutions, organizations, or informal sector)
  - c) Scavengers at collection points and final disposal sites
- 5) Equipment and facilities maintenance
- a) Organization and staffing  
(organization chart, duties and authorities, number of staff, person in charge)
  - b) Maintenance facilities and operation  
(workshop, equipment, maintenance records etc.)
  - c) Financial status  
(expenditures in 1995 and budget for 1996)
- 6) Privatization
- a) Legislation
  - b) Present situation and capacity of private sectors for waste treatment and management

- Extent of privatization (road sweeping, collection and disposal)
- Areas and waste amount dealt by private sectors
- Collection fee and method

7) Other information

a) List of local consultants and institutes and preliminary cost estimation (after discussion) for the field survey in the solid waste management study

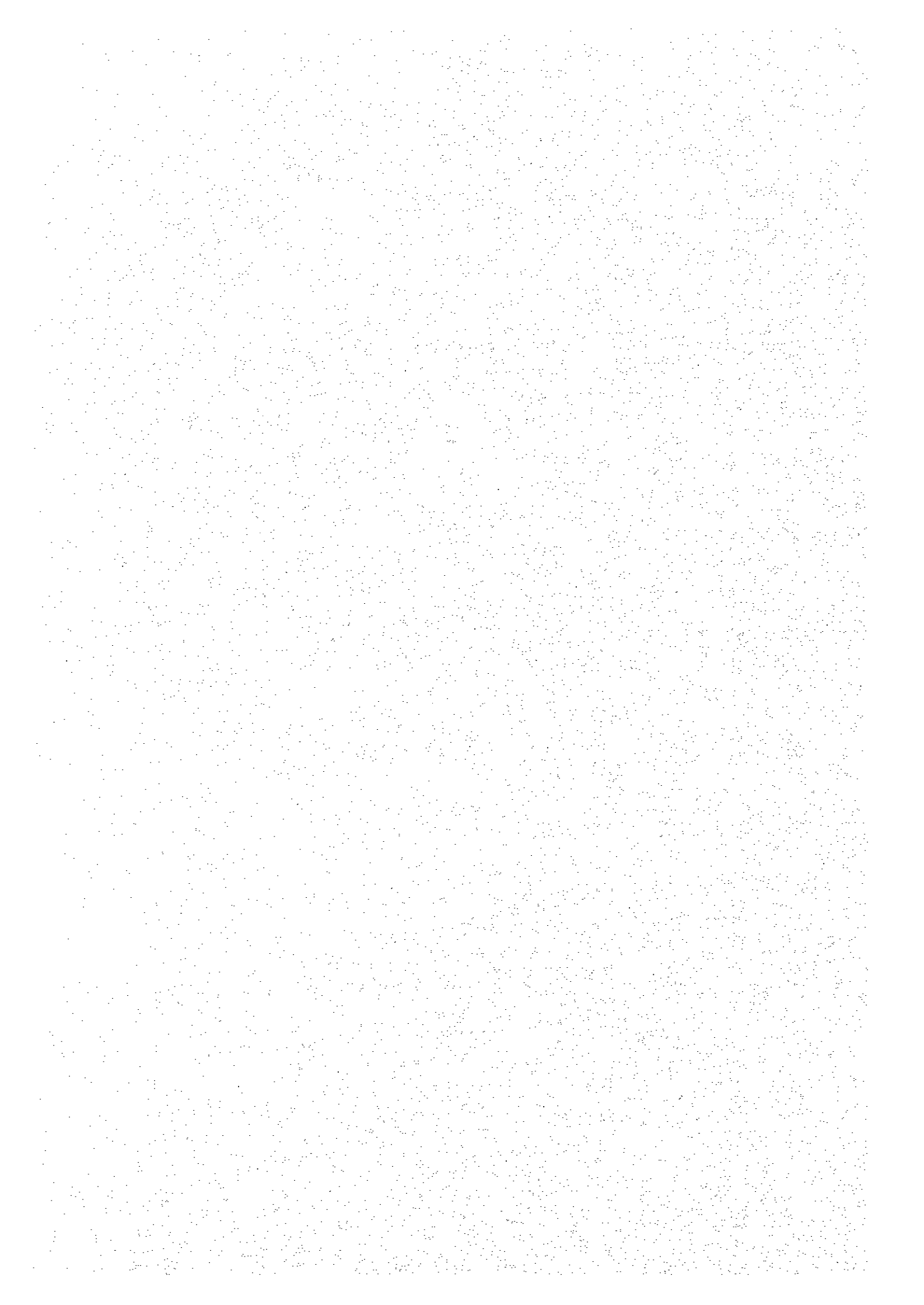
- Survey of the quantity and quality of solid wastes
- Survey of the public awareness on Solid Waste Management
- Time and motion survey
- Topographic survey
- Boring for Soil investigation and soil test
- Water quality analysis
- Environmental survey for IEE and EIA

b) Reference reports and books

Followings are names of the reference information found in the preliminary study in Japan. Please prepare one each in addition to the reports and information prepared for the Preparatory Study by NCC if they are not included.

- Economic survey 1995
- Statistical Abstract (latest publication)
- Development plan 1994-1996
- Kenya Population Census, 1989 (Vol. I & II)
- Nairobi District Development Plan 1994-1996
- Kenya National State of the Environment Report 1987 (UNEP)

#### ④ 面談者リスト





(1) 在ケニア日本大使館

塩崎 修 公使  
植松 龍二 二等書記官

(2) 地方自治省 (Ministry of Local Government)

Mr. R.K.A Siele EBS Permanent Secretary  
Eng. F. J. Mulli Deputy Director, Urban Development  
Mr. J. Amaya Senior planning Officer, Urban development  
Mr. W. Muhindi Sociologist, Urban Development

(3) ナイロビ市 (Nairobi City Council)

Mr. H. Oluoch Town Clerk  
Col. (Rtd) F.R. Nthiga Director of Environment  
Mr. S.W. Opiyo Deputy Director of Environment  
Mrs. M.M. Jobita Deputy Director, Housing Development  
Department  
Mr. J.M. Gachuhi Cleansing Superintendent  
Mr. J. Githua Assistant Cleansing Superintendent  
Eng. S. G. Gichoi Deputy City Engineer, City Engineer Dept.  
Mrs. L. Oyake Chemist, Department of Environment  
Mr. J.K. Barrehe Planner & Architect, City Planning Department

(4) 大蔵省 (Ministry of Finance)

Mr. J.K. Kinyua Financial Secretary  
Mr. J.K. Kanithi Undersecretary  
Mr. J.M. Nyanumba Officer of Japan Desk, External Resources  
Department

(5) 環境省 (Ministry of Environment and Natural Resources)

Mr. J.K. Kihumba Deputy Director, National Environmental  
Secretariat  
Mrs. O. Nyaga Deputy Coordinator, National environmental  
Action Plan

(6) 国際協力事業団ケニヤ事務所

田上 実	所長
山田良春	事務所職員
Mr. H. Barasa	Procurement Officer

(7) ジョモケニヤッタ農業工科大学

田口 定則	チームリーダー
渋谷 孝雄	シニア業務調整
浅野 栄一	土木専門家
村上 雅彦	園芸専門家

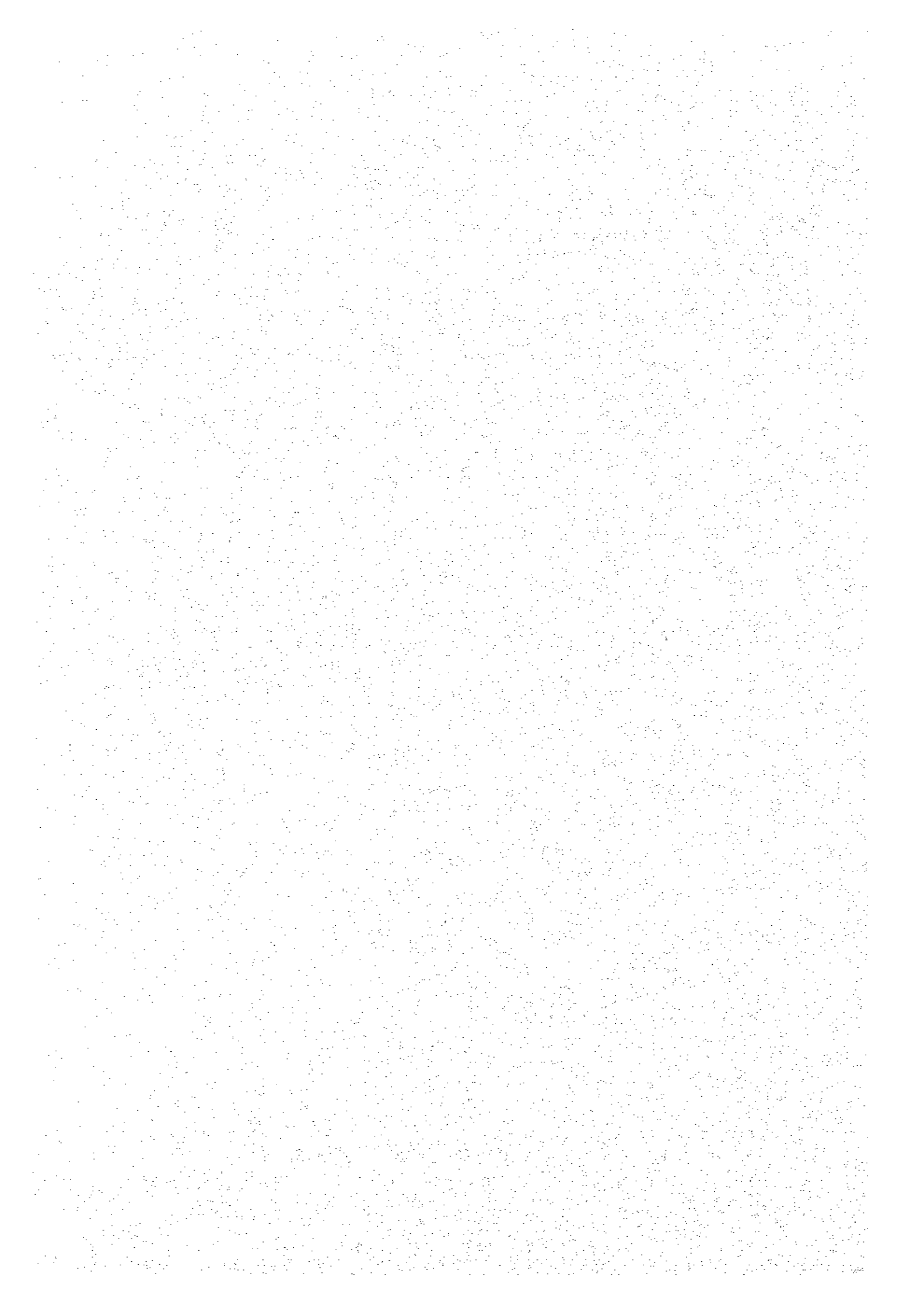
(8) 国連 (United Nation)

Dr. G. P.	Human Settlements Officer, Centre for Human Settlement (HABITAT)
-----------	---

(9) 民間清掃会社

Mr. T. Prior	Bins Services Ltd.
Mr. C. Fura	Domestic Refuse Disposal Ltd.

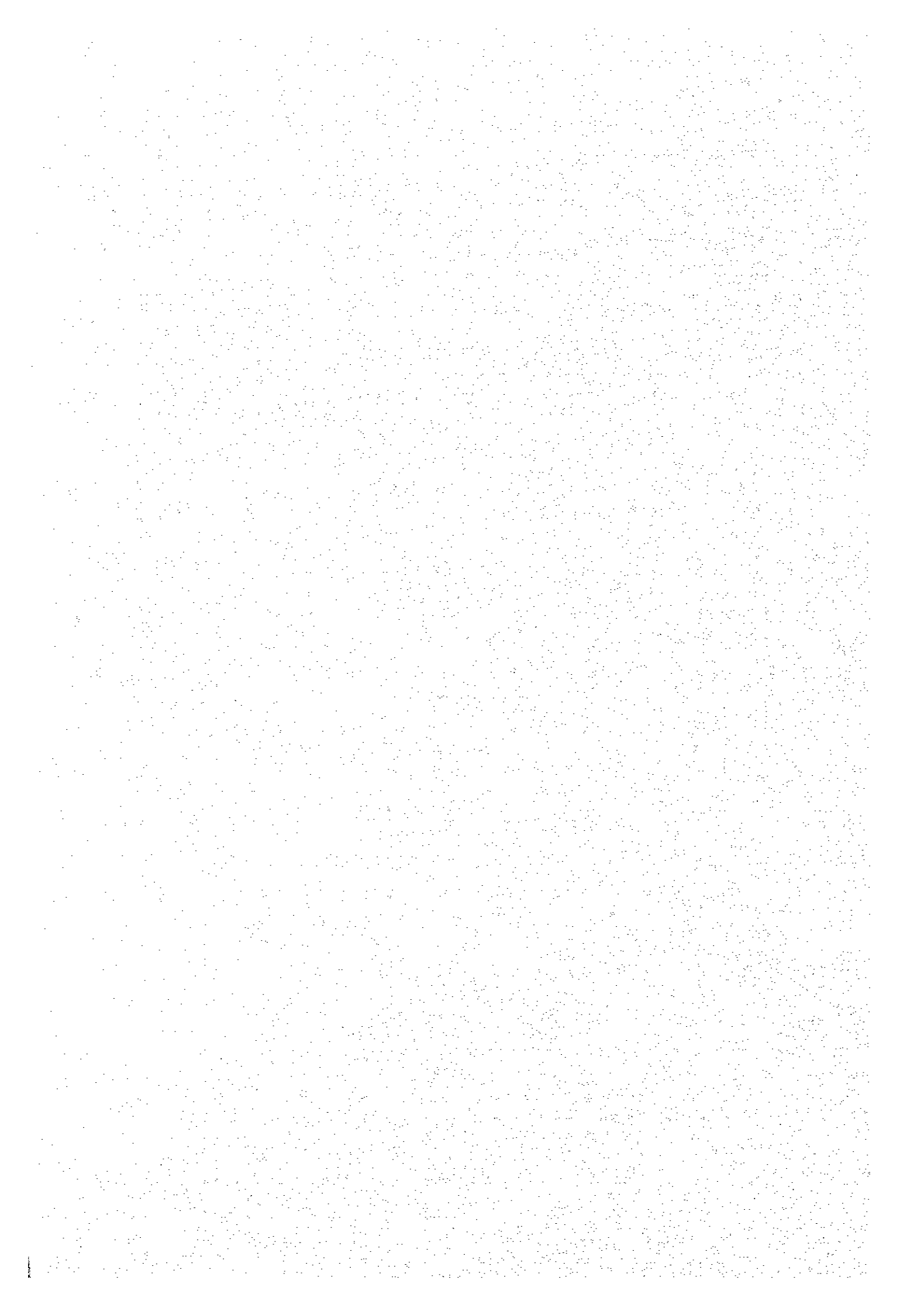
⑤ 収集資料リスト



地域	アフリカ	資料名又は 項目名等	ナイロビの成長物資料所蔵種別	資料の種類 又は形態等	出版年次 又は発行年	出版者氏名	出版年次	出版者氏名
川名	ケニア	配属機関名	ナイロビの成長物資料所蔵種別	資料の種類 又は形態等	出版年次 又は発行年	出版者氏名	出版年次	出版者氏名
1		Nairobi Metropolitan Growth Strategy (Vol. 1) (Main report)	都市計画	本	1974	City Council of Nairobi (Nairobi Urban Study Group)	1974	ナイロビ市議会議長
2		Nairobi Metropolitan Growth Strategy (Vol. 2) (Technical appendices)	都市計画	本	1974	City Council of Nairobi (Nairobi Urban Study Group)	1974	ナイロビ市議会議長
3		Geological Map of The Nairobi Area	地図	図面	30"	Ministry of Natural Resources (Mines & Geosciences Department KENYA)		ナイロビ市議会議長
4		Map of (Nairobi Area) 1/25,000	地図	図面	70"	United Nations Center for Human Settlements (Habitat)		ナイロビ市議会議長
5		Map of (Nairobi Area) 1/4, 1/2, 1/2, 500	地図	図面	30"	United Nations Center for Human Settlements (Habitat)		ナイロビ市議会議長
6		A Reference Handbook for Trainers on Promotion of Solid Waste Recycling and Refuse in the Developing Countries in Asia	本	本	199	United Nations Center for Human Settlements (Habitat)		ナイロビ市議会議長
7		Economic Survey 1996	本	本	203	Central Bureau of Statistics		ナイロビ市議会議長
8		Kenya Population Census 1989 (Vol. 1)	本	本	482	Central Bureau of Statistics		ナイロビ市議会議長
9		The Project for the Feasibility, The Implementation and the Management of the Collection, Transportation and Disposal of Urban Waste in the Towns of Nairobi, Nairobi, Nakuru, Kisumu and Eldoret	本	本	189	Ministry of (Republic of Kenya) Ministry of East Africa		ナイロビ市議会議長
10		Environment Impact Assessment (EIA) : Draft Report (Guidelines and Administrative Procedures)	本	本	131	Ministry of (Republic of Kenya) Ministry of East Africa		ナイロビ市議会議長
11		Land use map ( Nairobi )	地図	図面	30"	Ministry of (Republic of Kenya) Ministry of East Africa		ナイロビ市議会議長
12		A Map of Greater Nairobi with Street Index ( Nairobi )	地図	図面	40"	Ministry of (Republic of Kenya) Ministry of East Africa		ナイロビ市議会議長
13		Arterial Roads & Footways Layout (May 1981)	地図	図面	1/4"	Ministry of (Republic of Kenya) Ministry of East Africa		ナイロビ市議会議長
14		Dandora Community Dev. Project Prop. Layout Plan for Dandora Phase 1 & 11 (May 1976)	地図	図面	1/4"	Ministry of (Republic of Kenya) Ministry of East Africa		ナイロビ市議会議長
15		Nairobi North Area 1, 2, 3, 4 Community Facilities & Shopping Area A, B, C, D (July 1990)	地図	図面	1/4"	Ministry of (Republic of Kenya) Ministry of East Africa		ナイロビ市議会議長
16		Kenya Waste Project - Nairobi Sheet 7 First Western District Service	本	本	290	Ministry of (Republic of Kenya) Ministry of East Africa		ナイロビ市議会議長
17		City of Nairobi Map and Guide	本	本	81	Ministry of (Republic of Kenya) Ministry of East Africa		ナイロビ市議会議長
18		Development Plan 1994-1996	本	本	50	Ministry of (Republic of Kenya) Ministry of East Africa		ナイロビ市議会議長
19		National State of the Environment Report 1987 2	本	本		Ministry of (Republic of Kenya) Ministry of East Africa		ナイロビ市議会議長
20		Country Profile 1985-96	本	本		Ministry of (Republic of Kenya) Ministry of East Africa		ナイロビ市議会議長

番号	資料の名称	形態	紙型	ページ数	フォーマットの記号	部数	収蔵先名又は 発行機関 The Government of Kenya collaboration with the International Monetary Fund and the World Bank Central Bureau of Statistics United Nations Center for Human Settlements (Habitat) Ministry of Reclamation and Development of Arid, Semi-arid Area and Wetlands Nairobi City Council	所属・種入 種別の記号	現蔵区分	利用状況	利用言語種別名	備考	入 庫 日 記 号	入 庫 機 器 種 別
21	Economic Reforms for 1996-1998	本	A4	63	3C-	1								
22	Statistical Abstract 1995	本	A4	340	3C-	1								
23	African Waste Forum '94 Proceedings of a Regional Training Workshop 23 to 25 November 1994, Nairobi, Kenya	本	A5	50	3C-	1								
24	Environmental Action Plan for Arid and Semi-Arid Lands in Kenya	本	A4	41	3C-	1								
25	Nairobi City Council - Minutes of Proceedings of the Council and the Several Committees thereof for the Month of January 1996	抜粋	A4	2	3C-	2								
26	Nairobi City Council - Minutes of Proceedings of the Council and the Several Committees thereof for the Month of January 1996	抜粋	A4	48	3C-	48								
27	Nairobi City Council 1996/97 Estimates (NCC の決算書)	本	A4	138	1997A	1								
28	Nairobi City Council Water and Sewerage Dept. 1996/97 Estimates ( Nairobi City Council の決算書)	本	A4	84	1997A	1								
29	Scheme of Service for Local Authorities	本	A4	477	1997A	1								
30	The Public Health Act - Revised 1962	本	A4	149174	3C-	1								
31	The Local Government Act - Revised 1966	本	A4	210	3C-	1								
32	Organization of the Government - September 1995	本	A4	22	3C-	1								
33	The Kenya Gazette - January 26, 1996	本	A4	43	3C-	1								
34	Kenya Gazette Supplement No. 39 - July 29, 1998	本	A4	18	3C-	1								
35	Monthly Bulletin of the Ministry of Health - Aug. 1961	本	A4	18	3C-	1								
36	The City of Nairobi (General Meetings) By-Laws 1961	本	A4	9	3C-	1								
37	Nairobi City Council, Minutes of Proceedings - Jan. 1996	本	A4	2	3C-	1								
38	City Treasurer's Report on the 1995/96 Annual Estimates	本	A4	10	3C-	1								
39	Cleansing Section Status Report - July 1995	本	A4	6	3C-	1								
40	City Treasurer's Memo - October 25, 1995	本	A4	2	3C-	1								
41	City Engineer's Memo - October 25, 1995	本	A4	6	3C-	1								
42	Progress Report on City Cleanup Exercise	本	A4	6	3C-	1								
43	Letter and Newspaper Clips on Garbage in Nairobi City	本	A4	6	3C-	1								
44	City Planning & Architecture Dept. Approved Establishment	本	A4	6	3C-	1								
45	Housing Dev. & Management Dept. History Organization	本	A4	2	1997A	1								
46	City Inspectorate, Administrative Personnel	本	A4	4	1997A	1								
47	Institutional Information - Cleansing Section	本	A4	5	3C-	1								
48	Town Clerk's Department	本	A4	3C-	3C-	1								
49	City Engineer's Department	本	A4	3C-	3C-	1								
50	City Planning and Architecture Department	本	A4	3C-	3C-	1								
51	City Education Department	本	A4	3C-	3C-	1								
52	Public Health Department	本	A4	3C-	3C-	1								
53	Social Services and Housing Department	本	A4	3C-	3C-	1								
54	City Treasurer's Department	本	A4	3C-	3C-	1								
55	Water and Sewerage Department	本	A4	3C-	3C-	1								
56	City Inspectorate Department	本	A4	3C-	3C-	1								
57	Housing Development Department	本	A4	3C-	3C-	1								

## ⑥ ローカルコンサルタントリスト





## ローカルコンサルタントリスト (ABC順)

会社名	住所	電話番号	Fax 番号
Ainswin Research Consortium	P.O. Box 61543, Nairobi	502573	502573
Billtech Environmental Consultand	P.O. Box 56160, Nairobi	890939	890939
Environmental Management Services Sustainable Development Consultante	16, Jameson Court, Ngong Road P.O. Box 59667, Nairobi	570703	570703
Keipet Consultants	Garana Road, P.O. Box 55234, Nairobi	723592 719276	717533 712357
Mangar, I. B. Patel & Partners	P.O.Box 48674/710501, Nairobi	710500	710549
Otieno Odongo & Partners Consulting Engineers	671 Ngong Road P.O. Box 54021, Nairobi	570022	570103 570236
Photomap Internatioal Inc.	Masaba Road, P.O. Box 43805, Nairobi	726027 725306	726028
Surv-tech Land Surveyors	Muranga Road, P.O.Box 8971, Nairobi	--	--

## 実施可能分野

会社名	1.	2.	3.	4.	5.
Ainswin Research Consortium		○			
Billtech Environmental Consultand	○	○	○	○	○
Environmental Management Services Sustainable Development Consultante		○	○	○	○
Keipet Consultants	○				
Mangar, I. B. Patel & Partners	○				
Otieno Odongo & Partners Consulting Engineers		○	○	○	○
Photomap Internatioal Inc.			○		
Surv-tech Land Surveyors			○		

## 凡例

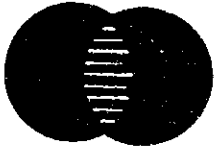
- 業務の種類： 1. 水供給及び衛生教育に関する住民意識調査  
 2. 環境調査  
 3. 地形測量  
 4. 土質調査  
 5. ごみ量・ごみ質調査

## 組織・制度、人材育成、啓蒙・広報活動に係るローカルコンサルタント等

組織・制度、人材育成、啓蒙・広報活動等に関してマスタープラン調査やフィージビリティ調査を実施する上では、ケニア国の法制、行財政及び現地習慣・行動パターン等の広汎な知識が必要と思われる。特に法制と行財政については、植民地時代の諸制度が、独立後急速に変質しかつ形式的には何らかの継承があったと考えられるため、歴史的な知識も必要である。

このような知識を有し、かつマスタープラン調査やフィージビリティ調査の枠組みに精通したローカルコンサルタントが得られるならば、大きな助けになると思われる。そこで事前調査中にカウンターパートに相談したところ、添付の通り2名の経歴書が入手できた。二人とも教育学の基礎教養が有り、それなりの経験もあるようなので参考のため添付する。

報酬については、一方の経歴書に一日480ドルとあるが、現地の所得レベルから見てもかなり高いように思われる。十分交渉して納得出来る範囲で支払うべきであろう。



# Environment Management Services

Sustainable Development Consultants

96Y04

P.O.Box 59667, Nairobi Tel: 570703 Fax: 254-2-570703, e-mail:ems@tt.gn.apc.org

4 November, 1996

Team Leader,  
JICA Solid Waste Management for Nairobi City

Dear Sir,

**Re: Training and Institutional Strengthening Expert -  
Solid Waste Management for Nairobi City (Mr. Tom Oyieke)**

We are pleased to forward to you the C.V of the above named person who is an associate of Environment Management Services. We are nominating him as the local expert for training, personnel management and institutional strengthening. His fee is US\$ 480 per day.

Yours faithfully,

Paul Kirai

Environment Management Services

**THOMAS OCHIENG' OYIEKE**

**MATRIX PRINCIPAL**  
(Kenyan)

**ORGANISATION AND MANAGEMENT SPECIALIST**

**Year of Birth:** 1943

**Qualifications:** - "Diplom Genossenschaftsoekonom". Degree equivalent to an M.Sc. in Economics from Phillips University, Marburg, West Germany.  
- Diploma in Co-operative Education, University of Wisconsin, USA.  
- Certificate in Strategic Planning, Cornell University, USA.  
- Certificate in Adult Teaching Methodology, Goede Institute of Adult Teaching, Goede, West Germany.

**EXPERTISE:**

Organizational development and management. Evaluation of organizations in terms of goals, structures, manpower requirements, and operational procedures. Assessment of training needs in management situations. Design and preparation of training methodologies, materials and programmes and facilitation of training courses to meet the needs assessed. Specialist in the informal sector enterprise and co-operative management. Facilitation of consultative processes in environmental awareness and moderation in the preparation of action plans to achieve the desired locally managed environment situation.

Thomas Ochieng' Oyieke is an economist specialized in organizational development and management. His formal employment and extensive consultancy experience have equipped him as a highly regarded expert in organizational assessment and upgrading, program planning and development and training with particular attention to management issues. He has exceptional skills as a communicator. He also is trained in and a trainer of strategic planning and has the ability to respond to issues which affect communities and their developmental needs at grass roots level.

Oyieke's qualifications include an M.Sc. in Economics, obtained from Phillips University, Marburg in West Germany in 1972, and two specialized awards, a diploma in Cooperative Education, obtained from the University of Wisconsin, USA, in 1977, and a certificate in Strategic Planning Methodology, obtained from Cornell University, Ithaca, NY, USA in 1982.

Oyieke joined Matrix Development Consultants as a Principal in 1989, after being an Associate for a number of years. He brought to Matrix substantial organizational development and management training expertise. His past work experience include:- developing a strategy for reorganisation, rehabilitation and providing training to strengthen institutional capacity for the cooperative societies in the sugar industry; undertaking economic, financial and organisational analyses of the cooperative organizations in eastern and southern Africa as a member of research department of International Cooperative Alliance and to promote education, training and publicity as an important management tool in the cooperative movement in Kenya. He also has several years experience as Personnel and Training Manager, having worked in that capacity both for Kenya National Federation of Cooperatives and Kenya Reinsurance Corporation. During this period of employment, he gained interest in insurance business and management. Oyieke has completed 5 ACII examination papers. He is also a long standing Member of British Institute of Management.

Since joining Matrix, Oyieke's consultancies have clustered primarily in the organizational and management domains particularly as these affect rural development. He has assessed a large number of economically oriented organizations and programs, frequently following up his analysis by leading the staff in strategic planning for organizational improvement. In many instances, he has been retained to provide staff with periodic technical assistance and training.

In 1986 Oyieke participated in the review of the first phase of the Domestic Water Supply and Sanitation Project of Lake Basin Development Authority. Responsible for financial, institutional and monetary analyses.

In 1989 Oyieke participated again in the formulation mission for second phase of the Rural Domestic Water Supply and Sanitation Project. Emphasis was on decentralisation of the services of the project during this phase.

In 1990 Oyieke evaluated the Regional Insurance Project in Zambia, Lesotho, Botswana, Tanzania, Kenya and Mauritius for the International Cooperative Alliance & Cooperative Insurance Development Bureau. The countries visited were Zambia, Lesotho, Botswana, Tanzania and Mauritius.

In 1991 Oyieke participated in the assessment of the needs for infrastructure investment to benefit informal sector development in some selected townships in Kenya. The assessment was to facilitate optimal use of bilateral grants from the Federal Republic of Germany to Kenya. Later advised the project on the best approach to the institutional and requisite organisational management for sustainability

In 1992 Oyieke participated in a team which assessed the potential of several selected townships in Kenya and advised the Ministry of Local Government in Kenya on which ones qualified for the support offered by the USAID for provision of infrastructure which would stimulate economic growth both of the towns and their immediate hinterland.

In the same year 1992 Oyieke participated in carrying out a baseline study of the private sector in Kenya to determine the problems they presently face in business development and expansion. This baseline study was to facilitate creating interest of investors both local and overseas in supporting private sector in Kenya.

Later in 1992 Oyieke facilitated a consultative workshop in Dar es Salaam which prepared a document for the redressing the environmental problems which the city faced. The Dar es salaam city consultation resulted in the Sustainable Dar es Salaam Programme, a project support by Habitat and UNDP.

In 1993 he carried out a national study in the personnel management practices in the cooperative movement in Kenya and prepared Guidelines for Personnel Policy/Terms and Conditions of Employment, Manual on Separation of Duties between the Committee and the Senior management staff and Guidelines for curriculum on training committee and senior staff to respond to the high performance expectations on their positions. The recommendations have been adapted and now form the basis for improved management approaches in the cooperative movement in Kenya.

In the same year, Oyieke was contracted by the Municipal Development Programme of the World Bank, based in Harare, Zimbabwe, to facilitate a consultation process for the Ministry of Local Government in the Republic of Malawi. The aim was to develop a strategic long term training plan for the staff of the local government and a revised approach to staff training at the Malawian Staff Training College. The reports of the consultation have formed a basis for revised policy in local authorities' staff development in Malawi. He applied the Goal Oriented Project Planning technique (ZOPP) in this process.

He has also carried out staff assessment of the Water Resources Assessment Division of the Ministry of Water Development in Kenya on behalf of DHV Consultants and provided backup on the preparation of job description and training packages to ensure improved performance. He has also recently reviewed the level of preparedness for the implementation of gravity smallholder irrigation programme for Irrigation and Drainage Branch of the Ministry of Agriculture in Kibwezi and Timau schemes.

Oyieke has worked with the Green Towns Project supported by the University of Wageningen to provide backup consultancy to the Environment and Urban Development Training Project of the Ministry of Local Government in Kenya and facilitated in consultative workshops to address environment improvement and development issues in three key urban centres. Participatory consultative approach was applied and action plans drawn by those concerned. The consultancy has resulted in the communities in those selected towns taking full responsibilities on the establishment and maintenance of healthy environments. The Goal Oriented Project Planning technique was applied which resulted a Logical Framework for development and service delivery.

He has also worked with the GTZ, the German Development Agency, in developing modalities for involving the slum communities of Voi and Kilifi in planning for upgrading. In this context, Oyieke has moderated workshops using the Goal Oriented Project Planning technique to plan for housing development through the National Cooperative Housing Union.

In 1995 Oyieke facilitated another consultative workshop in Dakar, Senegal which prepared the initial agenda for the global environment summit first meeting in South Africa. The meeting was bilingual, the outcome of which was immediately endorsed by relevant Ministers from 23 countries of Africa which were represented at the workshop.

## **RELEVANT EXPERIENCE**

### **INSTITUTIONAL ANALYSIS**

a). **Bilateral Agreement for Co-operative Support:ICA/KNFC/CIDA.**

Researched and prepared document which formed the basis for discussions between Kenya Government, ICA, KNFC, and CIDA for obtaining bilateral aid from Canada for promoting co-operative education and training in Kenya.

b). **Market Towns Development Project:- USAID/RHUDO & Min.of Local Government.**

Assessed the potential of several selected townships in Kenya and advised the Ministry of Local Government in Kenya on which ones qualified for the support offered by the USAID for provision of infrastructure which would stimulate economic growth both of the towns and their immediate hinterland.

c). **National Institutional Woodfuel Savings Programme Appraisal Study:- Bellerive Foundation.**

Appraised the performance of the programme in terms of the extent to which it had met its original objectives and recommended future direction and measures for fulfilling the redefined objectives.

d). **Co-operative Union of Lesotho: ICA/Lesotho Government.**

Participated in a baseline survey and wrote a report to ICA and the Government of Lesotho on procedures and feasibility for formation of a national co-operative union.

e). **Southern Turkana Irrigation Project - NORAD.**

Participated in the NORAD mid term evaluation of the Southern Turkana Irrigation Programme as the cooperative and organisation specialist and coordinating secretary of the team.

f). **Domestic Water Supply and Sanitation Project - Lake Basin Development Authority/Dutch Embassy.**

Participated in the review of the first phase of the Domestic Water Supply and Sanitation Project of Lake Basin Development Authority. Responsible for financial, institutional and monetary analyses.

g). **Rural Domestic Water Supply and Sanitation Project- Lake Basin Development Authority/Dutch Embassy.**

Participated again in the formulation mission for second phase of the Rural Domestic Water Supply and Sanitation Project. Emphasis was on decentralisation of the services of the project during this phase.

- h). **Development of Co-operative Insurance Services in Eastern Central and Southern Africa - ICA/CIDB - Sweden.**

Evaluated the Regional Insurance Project in Zambia, Lesotho, Botswana, Tanzania, Kenya and Mauritius for the International Cooperative Alliance & Cooperative Insurance Development Bureau. The countries visited were Zambia, Lesotho, Botswana, Tanzania and Mauritius.

- i). **Strategic Plan for Training of Local Government Staff: MDP/WB/Govt. of Malawi.**

Seconded to the Government of Malawi to moderate and facilitate a training needs assessment and strategic planning workshop for the staff of the Local Governments. The consultation included a review of the curriculum of the local government staff training college. The strategic plan formed the basis for Malawian Government policy on local government staff development.

- j). **Water Resources Assessment Project: DHV / DUTCH Embassy/Ministry of Water Development.**

Carried out staff assessment of the Water Resources Assessment Division of the Ministry of Water Development in Kenya on behalf of DHV Consultants and provided backup on the preparation of job description and training packages to ensure improved performance.

#### **SMALL BUSINESS SECTOR DEVELOPMENT**

- k). **Norwegian Volunteer Services Boat Building Group- Kalokol-NORAD.**

Evaluated the Norad supported Boat Building Project based at Kalokol which included an analysis of the fishing activities of the Turkana along the shores of the lake.

- l). **Infrastructure Needs Assessment for Informal Sector:- INA/GTZ.**

Assessed the needs for infrastructure investment to benefit informal sector development in some selected townships in Kenya. The assessment was to facilitate optimal use of bilateral grants from the Federal Republic of Germany to Kenya. Later advised the project on the best approach to the institutional and requisite organisational management for sustainability

- m). **Machakos Handicraft Project:- German Volunteer Services/ FES.**

Assessed the performance of the project in terms of its management to fulfil the original objectives for which it was founded and to recommend the type of support required for its future development. Organised and run workshops which formed basis for short and long term planning for the development of the project. Prepared financial estimates and cash flow proposals for 1992, both of which were adapted at the annual general meeting of the association held in October, 1991.

- n). **Credit Guarantee Scheme - FES/SEFCO.**

Retained as consultant by the Friedrich-Ebert-Foundation and Small Enterprises Finance Company to review the goals and objectives of the Credit Guarantee Scheme, train office bearers of the Credit Guarantee Associations in appropriate management towards self administration, and train members of Credit Guarantee Associations in elementary business record keeping procedures and proper business management.

- o). **Kenya Private Sector Promotion Study:- GTZ(Germany)/WORLD BANK.**

Carried out a baseline study of the private sector in Kenya to determine the problems they presently face in business development and expansion. This baseline study is to facilitate creating interest of investors both local and overseas in supporting private sector in Kenya.

p). **Jua Kali Study Phase II for ITDG Kenya**

Carried out a baseline study for possible support by Intermediate Technology for small enterprise businesses in production of capital and intermediate goods and services for producers and manufacturers in Migori District.

**ENVIRONMENT AWARENESS CREATION**

q). **Kenya Environment & Urban Development Training Project: Dutch Embassy/Ministry of Local Government.**

Provided backup consultancy to the Environment and Urban Development Training Project of the Ministry of Local Government in Kenya and facilitated in consultative workshops to address environment improvement and development issues in three key urban centers. Participatory consultative approach was applied and action plans drawn by those concerned. The consultancy has resulted in the communities in those selected towns taking full responsibilities on the establishment and maintenance of healthy environments.

r). **Environment Awareness Creation Consultative Workshop for Seychelles: Friedrich Ebert Stiftung/ Government of Seychelles.**

Carried out a situation analysis of the problems related to environment facing the Republic of Seychelles with the aim of mounting a consultative workshop to define appropriate actions to be taken by the different parties concerned to address the deteriorating environment within the republic.

s). **Sustainable Dar es Salaam: City Consultation on Environment Issues: Habitat/UNDP/City of Dar es Salaam.**

Prepared for and moderated a ten days workshop for Sustainable Dar es Salaam which came up with action plans to reinstate a clean environment in Dar es Salaam City. The original action plan will now be implemented as found suitable by UNDP and the City of Dar es Salaam.

t). **Regional Workshop on Environmental Strategies for African Cities in Dakar, Senegal: Habitat/UMP/ Ministry of Environment and Protection of Nature of Republic of Senegal.**

Prepared for and moderated a five days Pan-African workshop for twenty one African nations which came up with action plans and a regional agenda for urban environmental management and better use of external support as an input to Habitat II.

u). **Domestic Water Supply and Sanitation Project - Lake Basin Development Authority/Dutch Embassy.**

Participated in the review of the second phase of the Domestic Water Supply and Sanitation Project of Lake Basin Development Authority. Responsible for community participation and institutional and monetary analyses.

**Referees:** Mr. Jean Christophe Adrian, SCP Adviser, United Nations Centre for Human Settlements, Technical Cooperation Division, P O Box 30030, Nairobi (Tel. 521336)

Mr. Vincent Lubasi, Regional Director, International Cooperative Alliance, P.O. Box 946 Moshi, Tanzania.

Ms. Sara Wakeham, United Nations Centre for Human Resources Settlements, Technical Cooperation Division, P O Box 30030, Nairobi (Tel. 521336)



**OTIENO ODONGO & PARTNERS**  
**Consulting Engineers**

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**CURRICULUM VITAE**

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Name : Ochoro, Duncan Paul Outah  
Profession : Institutional Analyst  
Year of Birth : 1948  
Nationality : Kenyan

**KEY QUALIFICATION**

Mr. Ochoro has more than 15 years experience in Institutional Analysis having obtained his Bachelor of Education from the University of New Brunswick, Canada in 1980 and his Master of Business and Administration (MBA) from the University of Nairobi in 1987. His past assignments include being Resource Consultant for various organisation among them Kenya Posts & Telecommunication Corporation, Kenyatta National Hospital, Ministry of Co-operative Development (Kenya), Reli Cooperative Savings and Credit Society Ltd., Nairobi City Council, Kenya Wildlife Service, Tana and Athi Rivers Development Authority, National Council of Churches of Kenya, and Mumias Sugar Company. Overseas assignments include consultancies in countries such as the Gambia, Zimbabwe, and Botswana.

Relevant Projects include being Institutional Analyst for the World Bank sponsored Master-plan for Sewer, Sanitation, and Drainage for the Nairobi City Council; Staff Training for Nairobi City Council Water & Sewerage Department. He is also a lecturer at the University of Nairobi.

**EXPERIENCED RECORD**

- \* Master of Business and Administration (MBA), University of Nairobi, 1987
- \* Bachelor of Education, University of New Brunswick, Fredericton, New Brunswick, Canada, 1980.
- \* Diploma in Agricultural Education, Egerton Agricultural College, 1971
- \* Member - Kenya Institute of Management (KIM)
- \* Member - Institute of Personnel Management (IPM) Kenya

## EXPERIENCE RECORD

### March 1995 to date

- \* Consultant in Human Resource Management in the ongoing Civil Service Reform Programme (CSRP). For Government of Kenya.

### August 1995 to date

- \* Consultant in the Impact Evaluation of the Voluntary Early Retirement Scheme (VERS) and survey of the expectations of the potential retirees in Phase II of the VERS. This is in collaboration with a team from Management Development Assistance for Health & Population. The project is World Bank funded through the Kenya Government Civil Service Reform Secretariat in the Directorate of Personnel Management.

### September 1994 to date

- \* Presently a Resource Consultant in the implementation of "Immediate Improvement Programme" for the Third Nairobi Water Supply Project for the Nairobi City Council. This is a follow-up of a study done by the Serven-Trent Water Authority and Howard Humphreys and Partners, and funded by the World Bank. The assignment involves providing Operational and Billing-Training as an endeavor to equip Water and Sewerage Department Personnel with knowledge, skills and attitudes aimed at handling and improving Organization, and Management of the department.

### June - September 1994

- \* Consultant in the "Human Resources Development Plan" for Kenya Rural Enterprise Programme (K-REP) taking into account the following:-
  1. K-REP's Mission, Goals, and Objectives
  2. Structures and Functions
  3. Staffing Position and Levels
  4. Training Need Assessment
  5. Scheme of Service
  6. Staff Development Policy Plan

### June/July 1994

- \* Resource person in special Team building Management Development and Communication Skills Workshops for CARE International - Refugee Assistance Programme (RAP) personnel based at Regional Support Office in Dadaab and refugee camps in Kenya.

April/May, 1994

Coordinator and Resources Person in the institutional strengthening of the operations and management of National Social Security Fund (NSSF) - Kenya, through Supervisory Management Development Training Programme.

Consultant in "The Evaluation of the DGI-Financed Programme of The Foundation for Woodstove Dissemination (FWD)." DGIS is the Directorate General Voor Internationale Samenwerking development agency of Netherlands Government.

The assignment included evaluation of:

1. The effectiveness of the objectives of DGIS-Financed programme.
2. The efficiency and effectiveness of FWD in Networking and Woodstove information dissemination to regional and country stove agencies.
3. The quality and impact of FWD Publications Programme.
4. The effectiveness of the FWD Documentation Centre.
5. The institutional Capacity Development of FWD International Secretariat in Nairobi, Kenya.
6. by the Office of the Vice-President and Ministry of Planning and National Development; and The Ministry of Labour and Manpower Development.

Resource person in The Satellite Education Demonstration Project between The University of Nairobi - College of Education and External Studies; The University of Zimbabwe, and The Texas Agricultural and Mechanical University, U.S.A. April, 1994.

March 1994

Consultant (Resource Person) in the Kenya Young Men Christian Association (K-YMCA) Strategic Planning Workshop under the theme "Institution Development and Sustainability." The Workshop addressed the following areas:

1. Policy Framework of The K-YMCA
2. Projects Development and Management
3. Human Resources Management and Development
4. Financial Resource Mobilization
5. Financial Management System and Controls
6. Management Information Systems (MIS) in K-YMCA.

### December 1993

Consultant in the Review of the 1992 Corporate Plan of African Confederation of Cooperative savings and Credit Association strategies and mechanisms for capacity building of ACCOSCA and increasing its self-sufficiency in revenue generation. The ACCOSCA Management Staff were also trained on the technical and administrative mechanism for implementation of the Corporate Plan.

### November 1993

Consultant in Internal Evaluation of the National Council of Churches in Kenya (NCCCK). The exercise addressed the following areas:

1. NCCCK Constitution
2. NCCCK Policy Formulation
3. NCCCK Organizational Structure and Functions
4. NCCCK Resources and Facilities Base
5. Budgeting and Budgetary Controls
6. Management Practices

### August - December 1993

The assignment was aimed at Strengthening the NCCCK capacity as well as developing strategies and mechanisms aimed at implantation of the Round table Concept of decentralizing the projects and programmes to NCCCK member - churches; establishing the Round table centralized donor funding; and moving NCCCK from implementer to facilitator of Socio-Economic and Theological projects and programmes.

### April 1993

Resource person (Consultant) in the Writers' Workshop for Trainers' and Trainees' Manuals for Management Development Courses for Managers/Officers of Family Planning Projects/Programs in Africa. The Workshop was organised by Centre for African Family Studies (CAFS) and funded by United States Agency for International Development (USAID) in Nairobi - Kenya.

The study and report formed sub-heading of Chapter Nine of the Seventh National Development Plan 1994 - 1997 on Employment and Human Resources Development for The Government of Kenya.

The study was funded by The United Nations Development Plan (UNDP).

Consultant in Staff Training Needs Assessment of Community Wildlife Service (CWS) of the Kenya Wildlife Services (KWS). The assignment included:

- i) Conducting Training Needs Analysis for all technical staff.
- ii) Recommending appropriate training for all the staff.
- iii) Analysing and submitting a decomposed list of all technical staff based on their educational, and professional training and work experience.
- iv) Review of the CWS Division functions with a view to proposing appropriate restructuring and capacity strengthening for the Division.
- v) Establishing adequate staffing positions and levels in the Division.

The study was funded by USAID through the COBRA Project.

#### July 1992 - 1995

Second contract to next three years (Jul 1992 - July 1995) on "Operational and Billing Training" in Third Nairobi Water Supply Project for Nairobi City Commission - Water and Sewerage Department.

The project is funded by the World Bank and is aimed at improving the efficiency and effectiveness of the commission staff involved in Implementation of the Third Nairobi Water Supply Project. Training programmes include technical (operational) commercial and management components. The project also is reviewing the existing operational and administrative support systems as well as making appropriate recommendations on the re-design of such systems as required by the commission. .

#### July 1992 - December 1993

Consultancy in Manpower Planning and Norms Study for the Ministry of Livestock Development.

This was A World Bank funded assignment which was aimed at optimizing the quantity and quality of staff requirements for the technical department of the Ministry given the budgetary constraints. The project also included planning for a gradual reduction of Ministry Staff and Staff emoluments expenditure over a 10 year period without hurting the efficiency and effectiveness of the ministry's services to the farmer. Also included in the project was a review of the government's policy decisions on "privatization" of Veterinary Clinical and other sub-sector services and to make projections of the capacity of the private sector to gradually assume such services.

## 1991 - 1992

Commissioners' Conference to evaluate the impact of the Institutional capacity strengthening of the revenue departments as part of the ongoing Tax Modernization Programme (TMP) and to make projections for future activities. This was in June, 1992.

The Training and Consultancy Programmes conducted so far included:

1. Training Needs Assessment for all the Staff in the three revenue departments August - September, 1991.
2. Four Senior Management Seminars each lasting two weeks in September, and November 1991; and April and September, 1992.
3. Two Training of Trainers (TOT) Workshops for one week in October 1991, and three week in June, 1992.
4. Four Middle Management Development Seminar each lasting 10 days in October, November, 1991 and March and April, 1992.
5. Two Supervisory Development Course each lasting one week in January 1992.
6. Series of Control/Verification Management Courses each lasting 2½ days for eleven groups lasting throughout February, 1992.
7. Management Follow-Up of all Senior Managers who had attended the Senior Management Seminar to evaluate the impact of the training on their work performance. This was done in February, 1992.

## September 1991

Management consultant in management training and consultancy as part of institutional support and capacity strengthening for The Tax Modernization Programme (TMP). The assignment was covering all the three tax departments in Kenya. Income Tax, Value Added Tax and Customs and Excise Department.

The programme was funded by the World Bank through African Development Bank and sub-contracted by KPMG Peat Marwick.

Consultant in staff Performance Appraisal Workshop for all the Supervisory and Management academic and administration staff of the University of Nairobi. The workshop aimed at designing appropriate staff performance appraisal format and procedure being introduced by the University with effect from January, 1992.

July - October 1991

Consultant in a World Health Organization funded assignment for National AIDS Control Committee of the Ministry of Health - Kenya Government on "Survey to Evaluate the Impact of the Radio Programmes on the Control of AIDS in Kenya.

July 1990

A consultant in an AMP Project on Human Resources Management Restructuring for Machakos District Cooperative Union, covering:

- i) Personnel Administration
- ii) Job Descriptions
- iii) Manpower Planning
- iv) Performance Appraisal
- v) Management by Objectives
- vi) Training and Education

June 1990

Consultant in the Advanced Personnel Management Course for the on-going AMP Project at Agricultural Resources Centre at Egerton University funded by United States Agency for International Development (USAID)

November/December 1989

Consultant in Mumias Sugar Company Limited Training Programmes in:

- i) Performance Appraisal - January 1990
- ii) Industrial Relations - January 1990
- iii) Supervisory Development - February/March 1990
- iv) Industrial Safety and Hygiene - March/April 1990

Consultant in developing Projects Proposals for 1990 - 1994 for Breast-feeding Information Group (BIG) - Kenya.

The purpose of the assignment was:-

- i) To review and analyse the activities of BIG for the last 11 (eleven) years - 1978 to 1989.
- ii) Formulate BIG's New Vision for the next decade - 1990 to end of the century.
- iii) Based on the above findings, develop project proposals for 1990-1994 for donor funding.

### October 1989

Consultant in the Project of the Government of the Republic of Kenya entitled "Strengthening of Housing, Savings and Credit, and Consumer Cooperatives". This was United Nations Development Programme (UNDP) project with the International Labour Organization (ILO) as the Executing Agency; and Kenya's Ministry of Cooperative Development (MOCD) as the Implementing Agency.

My assignment was specifically on "Strengthening the Institutional, financial and control arrangement in the existing consumer network so as to develop wholesale and retail activity in the Cooperative Consumer Sector in the Kenya and consequently:-

- i) Identify potentials for development and expansion of the Cooperative retail and wholesale activity and the needs and benefits of this activity in both urban and rural areas of Kenya.
- ii) Prepare a detailed pilot Project for the development of Consumer Cooperative activity based on the recommendations of the survey.
- iii) Assess training and education needs and make recommendations on design of appropriate training programme.
- iv) Prepare and document relevant management and control systems for Consumer Cooperatives with a special emphasis on wholesale activity.
- v) Liaise with Finance Consultant to ensure prompt compilation of project document.

Consultant in developing scheme of Service for Kenya Energy and Environmental Organization (KENGO). KENGO is a Kenya national network of Non-governmental organizations (NGO's) and government institutions working in renewable energy, environmental conservation and community development projects in Kenya, with its secretariat in Nairobi. The purpose of the assignment was to develop an appropriate scheme of service for both Profession/technical and support of KENGO. The document has been adopted as an effective guideline for Personnel and Administrative policy formulation and implementation for KENGO; as well as a tool for seeking donor funding to support the human resource component of the organization.

### August 1989

Contracted by Promin Consultants Limited in Nairobi, Kenya as a consultant in the following workshops.

1. Job Evaluation Workshop for all the Senior staff of The National Council of Churches in Kenya (NCCCK).
2. Senior Management Workshop for Tana and Athi Rivers Development Authority (TARDA). The purpose of the workshop was to review the management and administration of TARDA and to develop action points for improving efficiency and effectiveness of the authority.



### August - December 1989

Consultant in African Confederation of Cooperative Savings and Credit Association (ACCOSCA) Study on Dues Collection. ACCOSCA is a Pan-African Cooperative Savings and Credit body with 25 member countries (national associations) having its secretariat in Nairobi - Kenya. The institution has had perpetual dues collection problem from its affiliates since its inception in 1970. Professional Training Consultants - Training, Management and Research Consultants based in Nairobi, Kenya was commissioned by ACCOSCA to conduct the dues collection study and make appropriate recommendations to ACCOSCA on how such problems could be overcome. During the Study we visited and interviewed league officials in Kenya, Ghana, Burkina Faso, Togo, Malawi, Zambia, Zimbabwe and Kenya. A final report was then written for ACCOSCA as guideline for improving its services to the affiliates as well as improving the dues collection from the member countries, and overall capacity strengthening of the cooperative movement in Africa.

Personnel Management consultant in Personnel Management Seminar held at Egerton University Resource Centre under the auspices of Agricultural Management Project (AMP). This was a training programme aimed at strengthening the management capability of public private organizations serving the agricultural small holders in Kenya. The project was jointly sponsored by the Government of Kenya (GOK) and the United States Agency for International Development (USAID).

### July 1989

Developed the Kenya Literature Bureau Personnel Policy and Training Policy guidelines to be used by the organization in improving the human resource management and development from 1990 onwards.

Developed a Draft Strategic Plan for the Kenya Young Men's Christian Association (KYMCA) for the 1990-1993 period. The plan was in three areas namely:-

1. Review of the philosophy, Policy, Objectives and Structure of the KYMCA.
2. The intended KYMCA programmes projections under:-
  - i) Leadership Development
  - ii) Christian Emphasis
  - iii) Socio-Economic Community Development Projects - Sports, Agro-forestry, Commercial, Education, Health, Infrastructure, etc.
  - iv) Vocational Training
3. Programmes/Project Monitoring and Evaluation Methods

#### June 1982

- \* Management consultant in Senior Administrative Staff Workshop for Moi University - Kenya. The purpose of the Workshop was to bring together all the Heads of Administrative and Academic departments of the new University (Moi University) to identify, analyse and formulate policies and strategies for the long-term management and development of the new institution. The workshop emphasized the following important areas:

1. Policy Development, Implementation and Monitoring
2. Management and Administration of public educational institution
3. Budgeting and Financial Management

#### January 1982

- \* Management training consultant for Mumias Sugar Company Limited - the largest white sugar milling industry in Kenya, and indeed East and Central Africa.

The management training assignment was in three sections:-

1. Senior Management Seminar for all Senior (Section Heads) for the company.
2. Executive Management workshop for all Heads of Departments
3. Inaugural Development Course for Superintendents reporting to the senior managers

The overall objective of the assignment was aimed at identifying management issues and problems affecting the productivity of the company, and discussing such issues and problems with the manager and recommending measures for improvement of productivity. In each case a report was written to act as a guide to the management of the operations of MSCO Limited, and overall capacity strengthening of the company.

#### January 1982

Resources Consultant in a Curriculum Development Workshop in Savings and Credit Courses in national cooperative colleges in Africa. The workshop was organized by African Confederation of Cooperative Savings and Credit Associations (ACCOSCA) from December 4th to 15th, 1983 in Nairobi Kenya, and attended by Principals of national cooperative colleges, Directors of Training in the national federations and national associations and General Managers of selected societies from 15 Anglophone member countries. The curriculum was developed in the following content areas.

1. Cooperation
2. Credit Union Management/Loan Administration
3. Book-keeping/Accounting
4. Financial Management
5. Management and Marketing
6. Cooperative Education and Extension

- \* Resource Consultant to the Ministry of Co-operative Development at a Cooperative Societies' Seminary for Chairman and Managers sponsored by Fulbright Ebert Foundation of Germany in Kericho and Kabarnet in Kenya in November, 1987.
- \* Marketing Consultant for KENGO Regional Wood Energy Programme for Africa on "Production and Marketing of Soapstone Stoves of Somalia", in Somali in September 1987. The study was funded by the United States Agency for International Development (USAID).
- \* Management Consultant in "The Study of Management and Administration of the Giant Reli Co-operative Savings and Credit Society Limited" - Nairobi Kenya in March/April 1987.
- \* Resource Consultant for the African Institute for Higher Technical Training and Research (A.I.H.T.T.R) Workshop on "New Development and Continuous Training in New Technologies" held in Nairobi in 1986. The participants were from Organization for African Unity (O.A.U) member countries - Kenya, Uganda, Tanzania, Zambia, Zimbabwe, Sudan, Egypt and Ethiopia.
- \* Resource Consultant at the United Nations High Commission for Refugees special management seminar for Emergency Refugee camp workers. The seminar was organized by the University of Wisconsin College of Education and Development and held in Nairobi, Kenya in 1984; for refugee workers in Eastern and Central Africa.

#### LANGUAGES

English, Kiswahili - Reading, writing & speaking all excellent.

Auditing  
Law  
Business Calculations and Statistics  
Data Processing

\* Marketing consultant in "The Energy Efficient Stoves in East Africa-An Assessment of the Kenya Ceramic Jiko (Stove) Programme". This was a special survey done jointly with Oak Ridge Associated Universities and Oak Ridge National Laboratory, U.S.A., with assistance from Kenya Energy and Environmental Organization (KENGO) and Co-sponsored by Regional Economic Development Support Office, East Africa, and U.S Agency for International Development, Office of Energy, Washington.

\* Resources consultant in The Second National Association Manager's Seminar organised by African Confederation of Cooperative Savings and Credit Associations (ACCOSCA) held in Nairobi - Kenya from July 19th - 28th, 1988. The seminar was for all 24 Anglo-phone and Franco-phone member countries and deliberated on General and Financial Management issues and problems experienced by national leagues and how such problems can be overcome.

\* Family Planning Association of Kenya (1988)

A consultant on a Family Planning Management Training Project (FPM) for Management Services for Health (MSH) of Boston USA, and funded by United States Agency for International Development (USAID).

The Consultancy covered Development and Implementation of Supervision System for Family Planning Association of Kenya (FPAK) headquarters. Specific areas covered included:

- (a) Developing and writing Job Description of all FPAK staff at the headquarters.
- (b) Designing in collaboration with FPAK staff a new supervision system which included check list for supervision, reporting forms, performance targets, frequency of supervisory visits, formulation of staff appraisal forms.
- (c) Developing and writing a Code of Regulations for FPAK.
- (d) Training FPAK staff at supervisory level on the use of the new supervisory system.

\* Resources Consultant to the Kenya Post and Telecommunications Personnel Officers seminary in Nairobi in February 1988.

\* Resource Consultant to the Kenyatta National Hospital Heads of Departments Management Seminary organised by KNH Continuing Education Committee in January 1988 in Nairobi.

\* Resource Consultant in the Kenyatta National Hospital Team Planning Meeting (TPM) for the team of local and foreign consultants appointed by Resources for Child Health (REACH) of JSI Inc. Washington to study KNH November 1987 at Leopard Beach Hotel Mombasa.







JICA