No. 1

BASIC DESIGN STUDY REPORT
ON
THE PROJECT
FOR
ROAD IMPROVEMENT AND MAINTENANCE
IN
DAR ES SALAAM
IN
THE UNITED REPUBLIC OF TANZANIA

MARCH, 1991

JAPAN INTERNATIONAL COOPERATION AGENCY

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PREFACE

In response to a request from the Government of the United Republic of Tanzania, the Government of Japan decided to conduct a basic design study on the Project for Road Improvement and Maintenance in Dar es Salaam and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA sent to Tanzania a study team headed by Mr. Kotarou NAGASAWA, Road Division, Chubu Regional Construction Bureau, Ministry of Construction, from December 3 to December 21, 1990.

The team held discussions with the officials concerned of the Government of Tanzania, and conducted a field survey at the study area. After the team returned to Japan, further studies were made and the present report was prepared.

I hope that this report will contribute to the promotion of the project and to enhacement of friendly relations between our two countries.

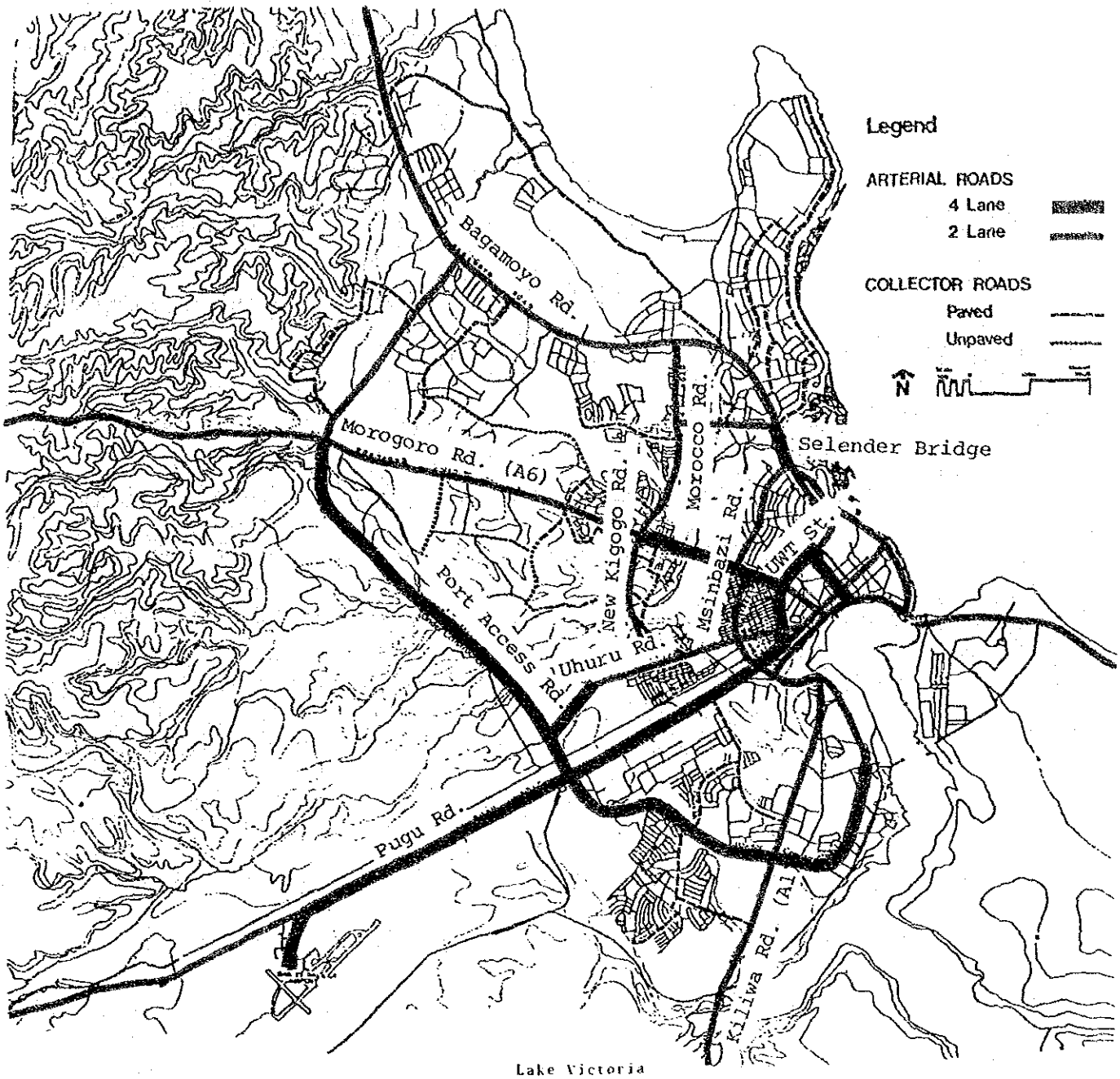
I wish to express my sincere appreciation to the officials concerned of the Government of the United Republic of Tanzania for their close cooperation extended to the team.

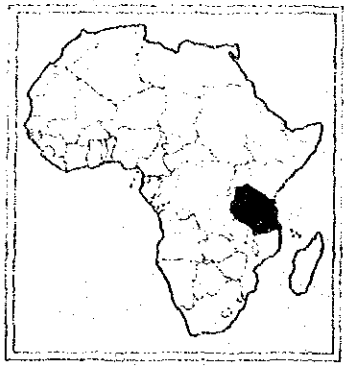
March, 1991

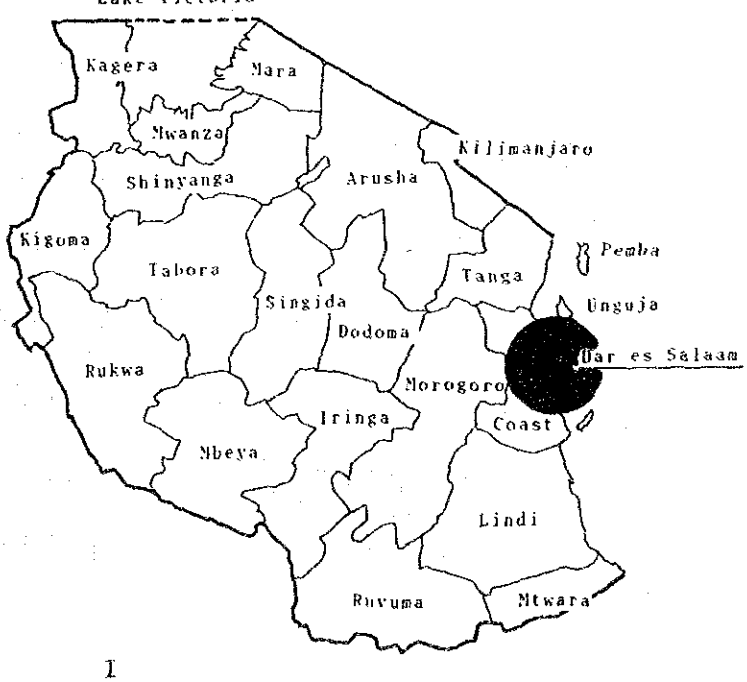
Kensuke Yanagiya

Kensuke Yanagiya
President
Japan International Cooperation Agency

LOCATION MAP







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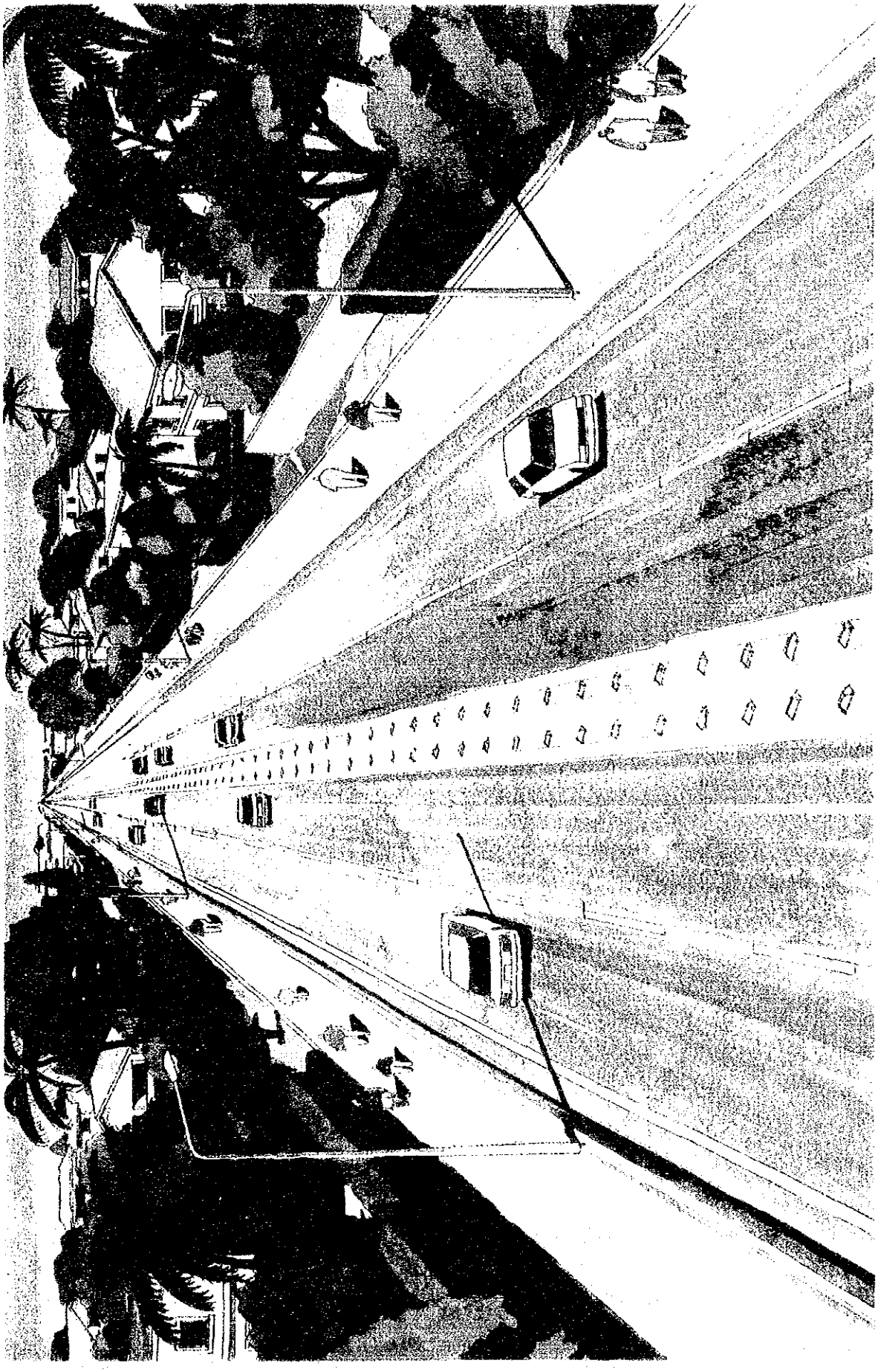


UPANGA ROAD

NEW BAGAMOYO ROAD

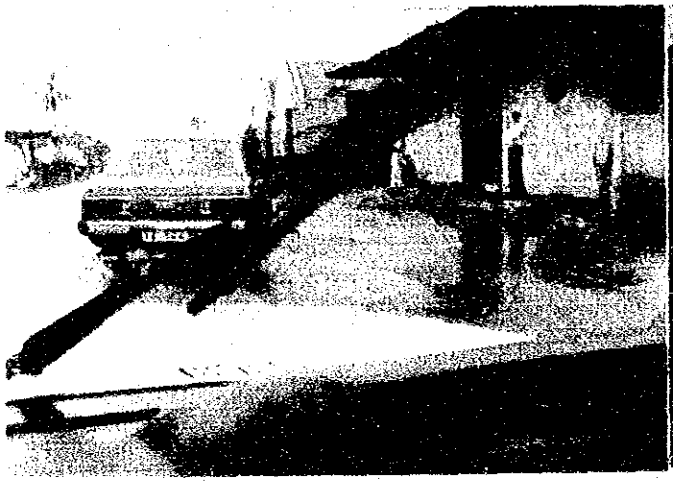
MOROGORO ROAD

EXISTING PAVEMENT CONDITIONS

Central Area

Kariakoo Area

Chango'mbe Area



Mwinjuma Area

Morogoro Road

New Bagamoyo Road

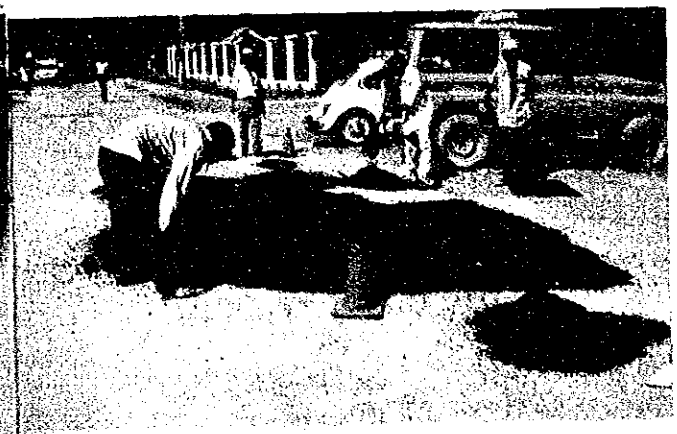
ROAD MAINTENANCE CONDITIONS

Drainage on Area Road

Drainage on Arterial Road

Pot-holes

Road Maintenance



Existing Central Work-shop

Existing Site Depot at Ilala

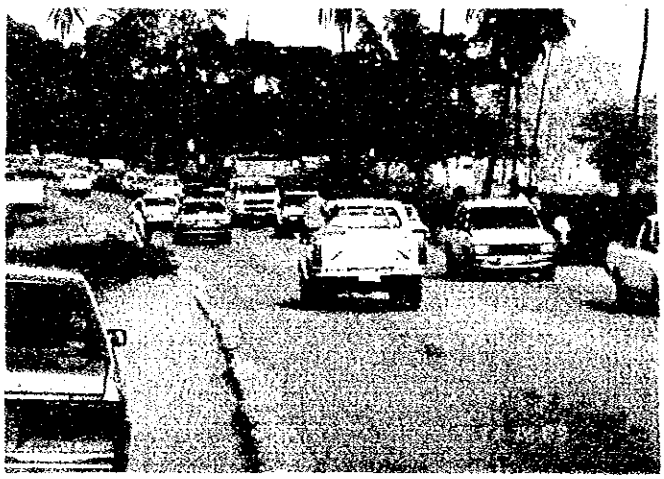
TRAFFIC CONDITIONS

Morogoro Road

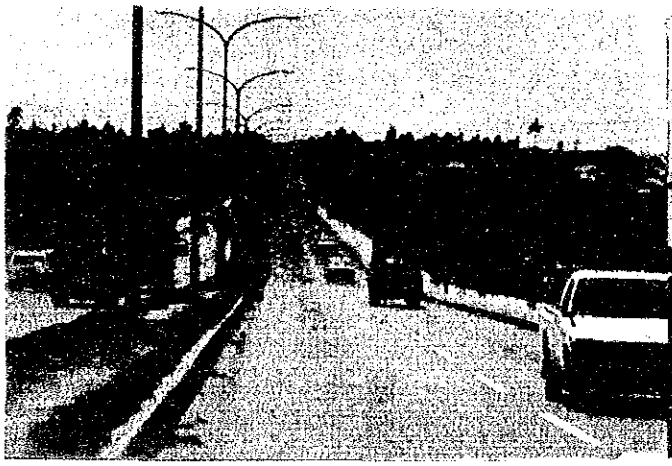
Morogoro Road at Manzese

Upanga Road

New Bagamoyo Road



Morogoro Road (completed section)

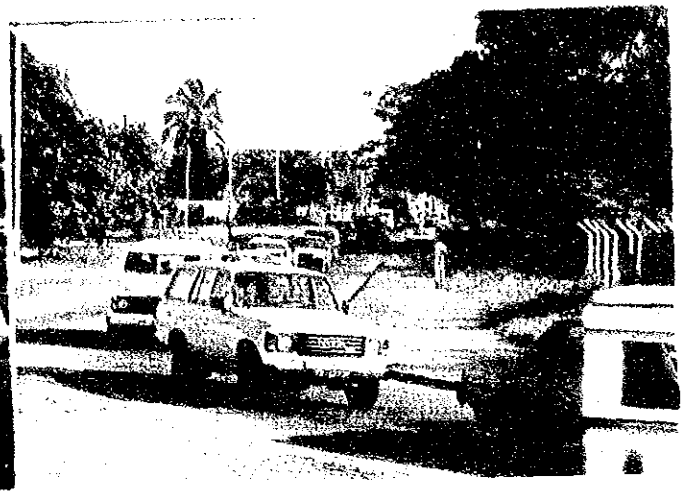


Selender Bridge (completed)

TRAFFIC CONGESTION

Peak-hour Traffic on Morogoro Road

Roundabout



Bus-stop

Pavement Deterioration

No Signal Control

Drainage System (Rainy Season)

SUMMARY

Dar es Salaam City, the capital and center of economic and social and administrative activities of Tanzania, has a total road network of 1,150 km. Most of the present roads have deteriorated seriousely to the level where normal routine maintenance is no longer cost effective by the long absence of proper and timely maintenance due to the shortage of funds and in-appropriate road maintenance operation. These deteriorated and narrow city roads have now become serious bottlenecks to the traffic movement and the safety of vehicles in Dar es Salaam City.

The Government of Tanzania (hereinafter referred to as the "Government") planned to improve road and maintenance system to eliminate the aforementioned bottlenecks in Dar es Salaam City and requested the Government of Japan in 1989 to conduct the Feasibility Study on "Road Improvement and Maintenance in Dar es Salaam". In response to this request, the Government of Japan decided to undertake the feasibility study and entrusted it to the Japan International Cooperation Ageny (hereinafter referred to as "JICA"). The feasibility study was conducted from March, 1989 to July 1990 and confirmed the feasibility of the project on technical, economic and social grounds.

Based on the study, Tanzanian Government requested the Government of Japan to study the possibility of implementation of this project under the Japan's grant aid programme. In response to the request of the Government, the Government of Japan decided to conduct a basic design study on the road improvement and maintenance system in Dar es Salaam (hereinafter referred to as the "Project"), and entrusted it to JICA. JICA organized a basic design study team (hereinafter referred to as the "Team") and despatched them to Tanzania in December, 1990 to exmine the Project vaibility under the Japan's grant aid system.

The following is the summary on the basic design study for the Project.

(1) Request made by the Tanzanian Government

Main works for which the Government of Tanzania requested Japan's grant aid in relation to the Project are as follows:

a) Category A "Improvement of Road Structures" for the five(5) packages of the roads including Upanga/New Bagamoyo Road, Morogoro Road, Chan'gombe Area Road, Kariakoo Area Road and Central Area Road (87.4 km in total)

b) Category B "Urgent repair for Selected Roads of Morocco, Kinondoni and Mwinjuma Roads (6.4 km in total) and

c) Category C "Improvement of Road Maintenance System and Operation" by provision of road maintenance equipment

The objectives of the Project aim at the improvement of road network and maintenance system in Dar es Salaam through the implmentation of three (3) categories of improvement measures mentioned above. The main concept of the Project is to reduce the heavy loss in terms of foreign exchange for maintaining motor vehicles to order spare parts and to minimize the loss of productive time due to the traffic jams.

(2) Study on the Request made by Tanzanian Government

Content of the Request made from the Government of Tanzania was studied taking into account the procedure and conditions of Japan's grant aid system.

As the result of cost survey in the Basic Design Study, it was concluded that the project road length in Kariakoo Area under Category A was decreased from 31.7 km to 21.6 km.

The remaining improvement measures shall be the same as they are and be implemented under the Project. The result of assessment and the location of the project road are presented in Table S.1 and Fig. S.1 respectively.

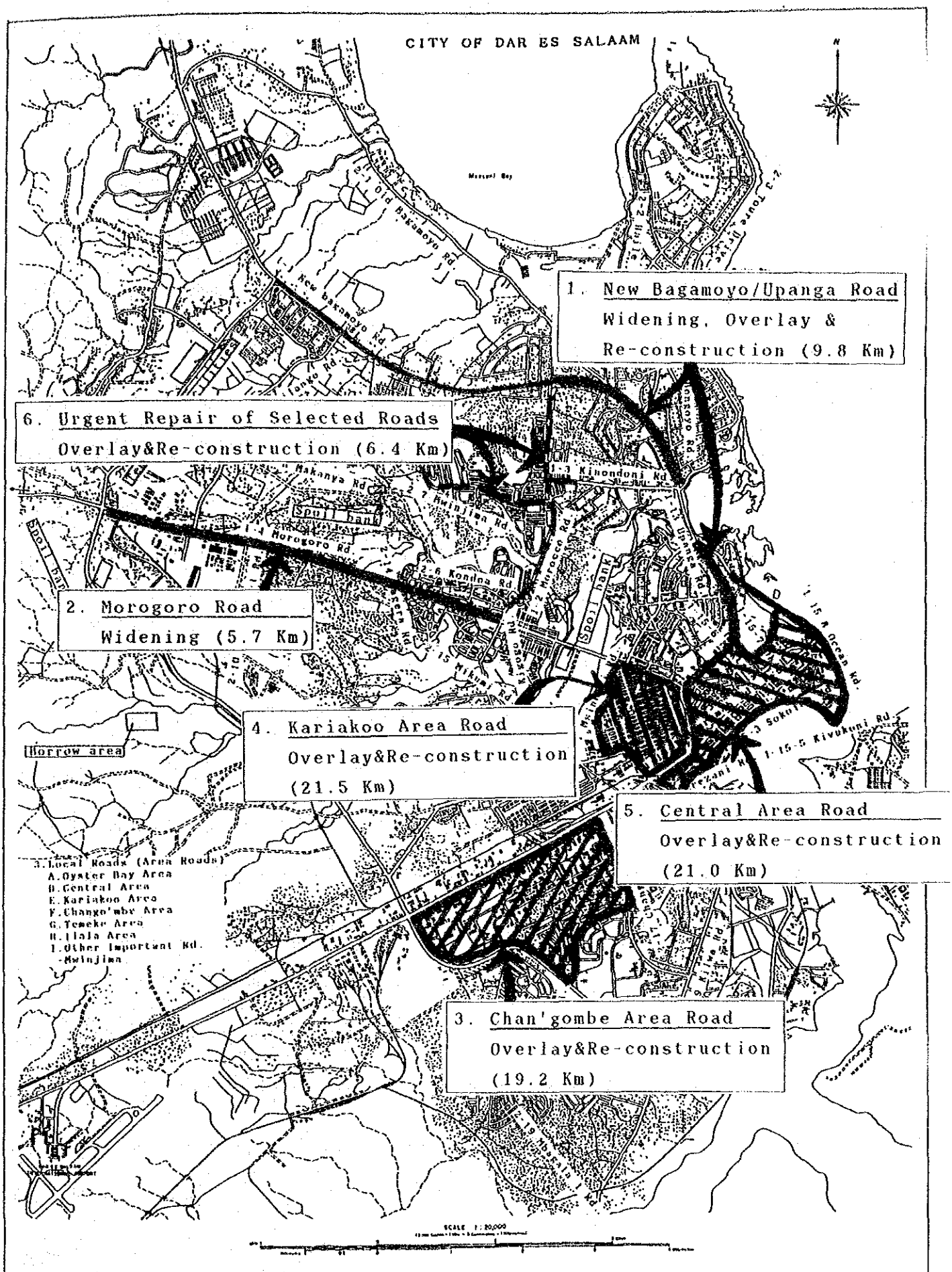


Fig. S.1 Location of Project Roads

Table S.1 Summary of Assessment of the Project

Work Items	Requested by Tanzanian Gov.	Result of B/D Study
1. Category A:"Road Improvement"		
(1) New Bagamoyo Road	9.8	9.8
(2) Morogoro Road	5.7	5.7
(3) Chan'gombe Area Road	19.2	19.2
(4) Kariakoo Area Road	31.7	21.5
(5) Central Area Road	21.0	21.0
	87.4 km	77.2 km
2. Category B:"Urgent Repair for Selected roads of Morocco, Kinondoni and Mwinjuma roads	6.4 km	6.4 km
3. Category C:"Improvement of Main-Maintenance and Operation" by Procurement of Equipment	Sum	Sum

(3) Basic Design

Basic design study was conducted employing the consecutive design policy established in the feasiblity study. The result of basic desgin study is summarized as follows:

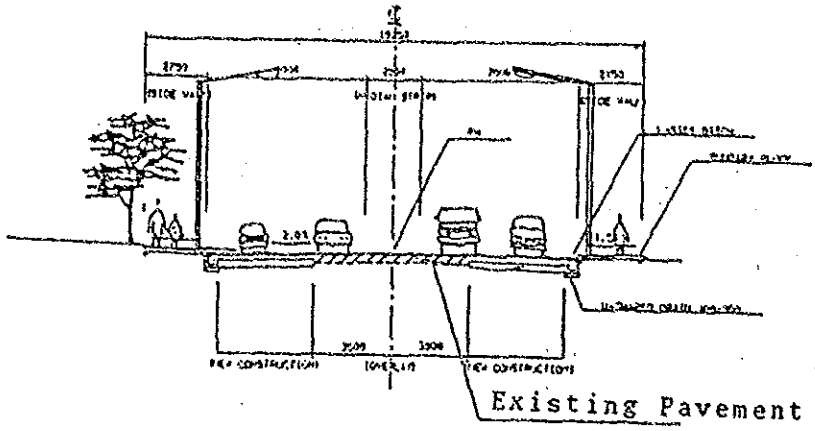
1) New Bagamoyo/Upanga Roads and Morogoro Road

The proposed New Bagamoyo, Upanga and Morogoro Roads were designed with a high design standards to meet the function of arterial roads which forcus on the Central Area of the City. Improvement measures proposed for these roads are widening from 2 to 4 lanes to solve the traffic congestion. Typical cross sections of each road is as shown in Fig. S.2.

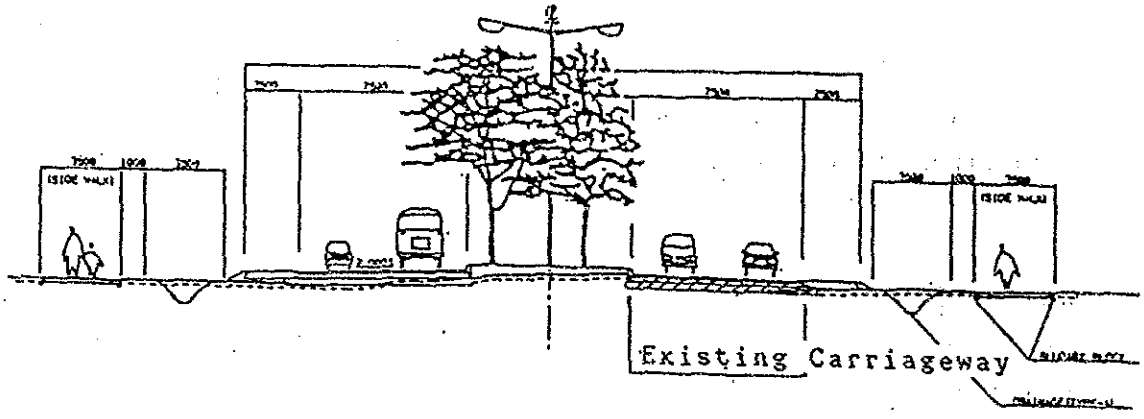
2) Area Roads including Central, Chan'gombe and Kariakoo

The improvement measures to be applied for the Area Roads are overlay and reconstruction of pavement including minor improvement of drainage system on the existing road in the above three areas.

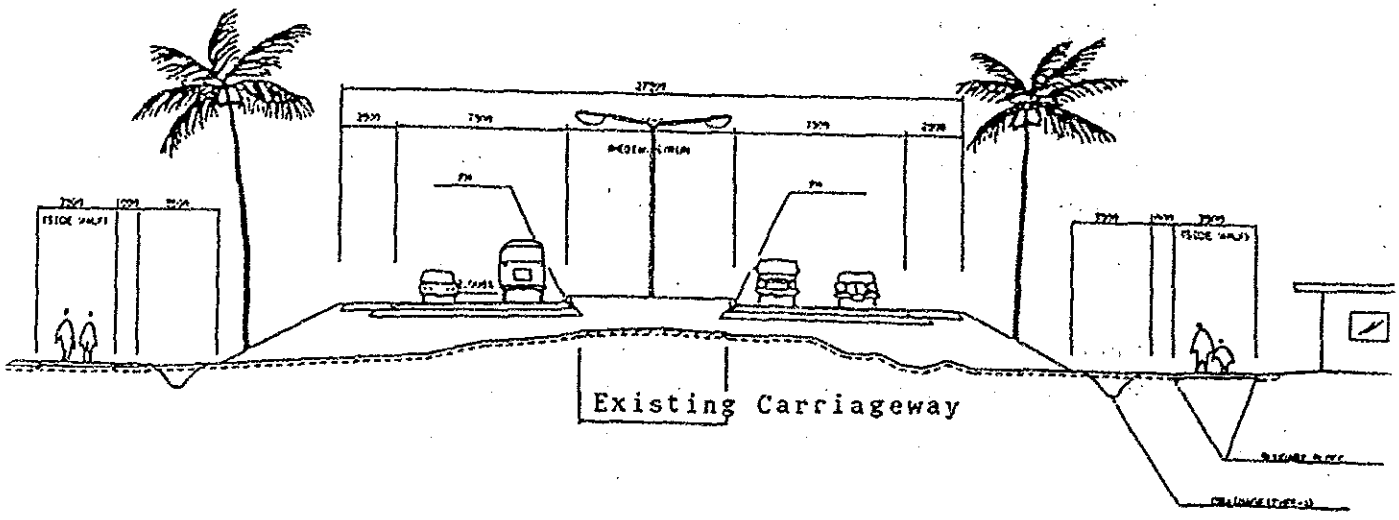
Table S.2 shows the summary of design features;



Upanga Road



New Bagamoyo Road



Morogoro Road

Fig. S.2 Typical Cross Section of Proposed Roads

Table S.2 Summary of Design Features

(1) Areterial Road

Description	New Bagamoyo Road	Upanga Road	Mogorogo Road
Improvement Measures	8.0 km	1.8 km	5.7 km
Widening	2.5 km	1.3 km	5.7 km
Reconstr. of pavement	2.4 km	0.2 km	-
Overlay of pavement	0.6 km	0.3 km	-
Maintenance	2.5 km	-	-
Design Features			
Design Speed	80 km/hr	60 km/hr	80 km/hr
Pavement Width	4 lanes (2x2x3.75m)	4 lanes (2x2x3.75m)	4 lanes (2x2x3.75m)
Shoulder	1.50-2.50m	0.5 m	1.50-2.50m
Median Strip	7.50-10.0m	0.5 m	7.50 m
Sidewalk	2x3.50 m	2x3.0m	2x3.50m
Pavement	Asphaltic concrete (Pre-mixed)		

(2) Area Roads

Description	Chan'gombe Area Road	Kariakoo Area Road	Central Area Road
Improvement Measures	19.2 km	21.5 km	21.0 km
Widening	- km	- km	- km
Reconstr. of pavement	9.0 km	15.3 km	3.7 km
Overlay of pavement	4.8 km	3.7 km	17.1 km
Maintenance	5.4 km	2.5 km	0.2 km
Design Features			
Pavement	Asphaltic concrete (Pre-mixed)		

(4) Procurement of Equipment

Road maintenance equipment to be supplied under the Category C was recommended as the result of the Basic Design Study as shown in Table S.3.

Table S.3 List of Road Maintenance Equipment

Equipment	Specification	Quantity
1. Dump truck	4 ton	5
2. Cargo truck	4 ton with crane	2
3. Pick up	1 ton	4
4. Sprayer	30 l/min.	2
5. Hand roller	600 kg	2
6. Plate compactor	50 - 60 kg	4
7. Wheel loader	0.4 m3, WS200A	1
8. Motor cycle	120 cc	4
9. Asphalt cutter		2
10. Compresser	280 l	2
11. Mini. backhoe	0.1 m3	1
12. Hand breaker	1.3 m3/min.	2
13. Tool box	large size	1
14. Tool box	small size	5
Spare parts for Existing Motor Grader (GD600R) owened by DCC		1 lot

(5) Implementation Agency

Dar es Salaam City Council (DCC) under the Ministry of Regional Administration and Local Government is the responsible agency for the implementation of the Project and act as the executing Agency of the Project in cooperation with the Ministry of Works (MOW) as a technical ministry.

DCC agreed to establish the project office for the implementation of the Project under the direct supervision of the City Engineer. In addition, DCC also agreed to strengthen the exisitng site depot at Ilala so that the equipment to be provided under Category C could be kept and maintained properly.

After the implemetation of the Project, DCC will be responsible for the maintenance of the proposed roads. It is re-

commneded to strengthen the function of this division through on-the-job training of the Project.

(6) Undertakings by Tanzanian Government

DCC has confirmed that necessary land acquisition and removal of houses should be completed prior to the start of construction. Construction works to be undertaken by the Japanese side will be improvement of road structures proposed in Category A including five (5) road packages and urgent repair for selected roads in Category B of the Project.

Those to be undertaken by Tanzania side will be land acquisition and removal of houses, relocation and protection of public utilities including water main, telephone cable, street lighting columns, electric cable, etc.

DCC has agreed to secure the budget for fulfilling the undertakings to be covered by Tanzanian Government mentioned above.

(7) Implementation Programme

As the executing agency of the Project, DCC will establish the project office for the Project in cooperation with MOW and operate and manage the project office smoothly and effectively.

The following is the tentative implementation programme proposed by the Team taking into account the conditions of Japan's grant aid programme.

(1) 1st Year: Lot A-5: Central Area Road
Lot B-1: Urgent Repair of Selected Road of Morocco, Kinondoni and Mwinjuma
Lot C-1: Procurement of Maintenance Equipment
(2) 2nd Year: Lot A-1: New Bagamoyo/Upanga Road
(3) 3rd Year: Lot A-2: Morogoro Road
(4) 4th Year: Lot A-3: Chan'gombe Area Road
Lot A-4: Kariakoo Area Road

(8) Project Benefit

Project benefits expected by the Implmentaton of the Project are the reduction of running costs including repair and maintenance of vehicles and the time saving by improvement of running speeds. As the result of the review on the economic feasibility referring with the feasibility study made by JICA in July, 1990 the following attractive economic indicators are revealed and therefore they are considered to be appropriate.

Benfit/Cost Ratio	= 2.3
Net Present Value	= Tshs. 6,000 Million
Internal Rate of Return (IRR)	= 25.4 %

In addition to the above, the Project is expected to bring about great indirect effects on the surrounding areas, such as acceleration of land-use development, enhancement of regional economy by improvement of intersector economic activities, improvement of road function, etc. Total number of population that will benefit directly from the implementation of the Project is estimated to be 540,000 people or 40% of the whole population of Dar es Salaam City (1.3 million). Area that will benefit from the Project would cover the whole unban and urbanized areas of the City.

(9) Project Viability

It is concluded that the Project for the Road Improvement and Maintenance in Dar es Salaam City is commendatory and appropriate for Japan's Grant Aid Programm. The Project will improve traffic services within its surrounding area, and reduce great amount of running cost and travelling time of vehicles in the City.

In order to realize a smooth implementation of the Project and adequate operation and maintenance after implmentation of the Project, it is recommended to strengthen the road maintenance division in the Engineering Department of DCC.

Basic Design Study Report

on

Road Improvement and Maintenance

in

Dar es Salaam

Final Report

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ABBRABIATIONS

AADT	:	Annual Average Daily Traffic
AASHTO	:	American Association of State Highway and Transportation Officals
AC	:	Asphaltic Concrete
ADT	:	Average Daily Traffic
C.R.	:	Congestion Ratio
DCC	:	Dar es Salaam City Council
DSM	:	Dar es Salaam City
DBST	:	Double Bituminous Surface Treatment
ESA	:	Equivalent Standard Axles
GDP	:	Gross Domestic Product
GRP	:	Gross Regional Product
IRR	:	Internal Rate of Return
JICA	:	Japan International Cooperation Agency
KAMATA	:	National Buses Company (Kampuni ya Mabasi ya Tiafa)
MOW	:	Ministry of Works
O-D	:	Origin and Destination
p.a.	:	per annum
p.c.u	:	Passenger Car Unit
PSI	:	Present Serviceability Index
TRC	:	Tanzania Railways Corporation
TRM	:	Trunk Road Maintenance
UDA	:	Dar es Salaam Transport Corporation (Shirika la Usafiri DSM)
U.S.A.	:	United State of America
VOC	:	Vehicle Operating Cost

CHAPTER 1 INTRODUCTION

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The Government of Tanzania is currently preparing a new five-year Development Plan in close coordination with the Economic Recovery Program(ERP), particularly with regard to the investment in the key sectors of agriculture and transportation. In the transportation sector of the ERP, the national priority policy is given to the maintenance and rehabilitation of the existing roads and the completion of on-going projects.

The road network of Dar es Salaam consists of a total of some 1,150 km, of which 450 km are bitumen roads and remaining 700 km are gravel and earth roads.

Due to the higher rate of city expansion as well as the recent acute increase in vehicle traffic in Dar es Salaam accompanying with the recovery of Tanzania's economic situation, the traffic flows on city roads have greatly increased.

Most of the city roads, however, have seriously deteriorated to the extent that normal routine maintenance is no longer cost effective. The deterioration of not only major roads in the urban areas but also local roads in the residential areas are conspicuous.

The excessive damage of the city roads has been caused mainly by the long absence of proper and timely maintenance due to the shortage of funds, small maintenance capacity caused by the shortage of equipment and inappropriate policies regarding regular maintenance and rehabilitation.

Since the city roads in Dar es Salaam are of vital importance for the city's economic, social and administrative activities, urgent rehabilitation and improvement measures are essential.

Under this situation, the Government of Tanzania requested the Government of Japan to conduct a feasibility study on road improvement and maintenance in Dar es Salaam.

In response to the request, the Government of Japan commissioned the Japan International Cooperation Agency(JICA), the official agency responsible for the implementation of technical cooperation programs of the Government of Japan, to conduct the feasibility study for the project during March 1989 and July 1990.

The feasibility study confirmed the viavility of the project on technical, economical and social grounds and recommended to implement the high priority projects in the Short-term Plan in 1990 to 1995 which consists of three categories of improvement measures namely, Category A "Rehabilitation/Improvement of Road Structure", Category B "Urgent Repair of Pot-holes for the selected roads" and Category C "Improvement of Road Maintenance Systems in Dar es Salaam".

Based on the feasibility study, the Government of Tanzania decided to implement these high priority projects and made a request to the Government of Japan to study the possibility of implementation under the Japan's grant aid programme.

In response to the request of the Government of Tanzania, the Government of Japan decided to conduct a basic design study (here-inafter referred to as the "Study") for the Road Improvement and Maintenance in Dar es Salaam (hereinafter referred to as the "Project") and entrusted the Study to JICA.

JICA organized a study team, headed by Mr. K. Nagasawa, Ministry of Construction and conducted the study and reveiw of the Project making reference to the feasibility study on "Road Improvement and Maintenance in Dar es Salaam" prepared by JICA in July 1990.

This report was prepared taking into consideration the "Minutes of Discussion signed between Tanzanian Governments and the study team on December 11, 1990. The Minutes of Discussion, Itinerary of Study, List of Collected Data and Documents are attached to this report as appendixes.

CHAPTER 2 BACKGROUND OF THE PROJECT

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2.1 General Situation of Tanzania

2.1.1 National Land and Population

Tanzania is a nation established in 1965 through the combination of Tanganyika and Zanzibar which gained independence in 1961 and 1964 respectively. Tanzania is located between lat. $1^{\circ}$and $11^{\circ}45'$ S, and between long. $29^{\circ}20'$ and $40^{\circ}38'$E, and covers 945,000 Km^2. Most of its territory is covered with savanna and dry-savanna, with some tropical rain forests and coastal mangrove forests.

The climate is cool around Mt. Kilimanjaro in the north and around the Lake Nyasa in the west. The climate can be divided into two seasons; a dry season from June to October and a rainy season from November to May. In Tanzania most parts suffer from flood or drought because of insufficient or irregular rainfall. The mean temperature is influenced by altitude, and ranges from around $26^{\circ}C$ on the coastal plains to under $20^{\circ}C$ above 1,200m.

In 1988 the total population of Tanzania was 23.2 million, and the annual growth rate was 2.8%. The population density is 24.5 persons/Km^2.

As for the educational system, it takes 6 years for elementary school, 6 years for junior high school, and 3 years for university. The literacy rate was as high as 79% in 1980 and since then the Government has put much stress on education.

2.1.2 National Economic Trends

The Gross Domestic Product(GDP) in 1986 amounted to Tsh. 131,300 million (US$ 7,200 million) in total and Tsh. 6,000 (US$ 332) per person. The export value in 1986 amounted to US$ 770 million.

Tanzania's economy is based on agriculture with emphasis on such crops as coffee, cloves, cotton, cashew nuts, tabacco and tea. The agricultural sector provided 39% of GDP in 1985, and the export value of products of the above six crops amounted to 84% of the total export value in 1985. Both GDP and agricultural products were growing steadily at rates of 5.4% and 3.4% during the period of 1968-1972.

Economic growth was depressed from the late 70s due to the sudden rise of oil prices. The situation deteriorated further due to worldwide recession, bad export conditions and droughts in the early 1980s. The economic situation become stagnant as may be seen from the average growth rate of GDP during the period of 1980-1982 which was 1.1%.

To cope with decline, the Government of Tanzania announced a three year Structural Adjustment Program(SAP) in 1982 to launch an economic recovery. As a result of this Program, GDP climbed from Tsh. 23,600 million in 1983 to Tsh. 25,500 million in 1986 at 1976 constant prices with an annual growth rate of 2.6%. The growth rate of per capita GDP, however, was negative due to the increase in population. The principal economic indices are tabled below.

(unit: million Tsh.)

Items	1982	1983	1984	1985	1986	1987	1988
Population	19.2	19.8	20.5	21.2	21.3	21.9	22.5
GDP	52,546	61,008	76,264	99,330	131,346	192,969	290,667
GDP(1976price)	24,104	23,472	23,930	24,561	25,486	25,972	27,085
GDP/capita (Tsh.)	2,737	3,081	3,720	4,685	5,998	8,811	12,919
GDP/capita (Tsh.,1976price)	1,255	1,185	1,167	1,159	1,164	1,186	1,203
Export	3,767	4,573	5,125	4,994	11,391	19,713	34,718
Import	10,239	10,478	12,960	17,470	34,329	51,902	90,639
Balance	-6,472	-5,905	-7,856	-12,476	-22,938	-42,189	-55,921
Inflation Rate	28.9%	27.1	36.0	33.3	32.5	30.0	31.2

Source: Tanzania Economic Trend 1990, University of Dar es Salaam

The inflation rate, which was 10% in 1970s, became 30.0% in 1987 and 31.2% in 1988 respectively. Wages declined sharply compared with those of 1980, while the nominal wage was raised by 25% in 1981 and 35% in 1984.

Tanzanian's national budget has shown deficits since 1980 thus the development budget has been severely constrained. Such policies as subsidy curtailment to semi-government enterprises, partial charge of the cost of junior high school education to individuals, and the introduction of development tax on people over 18 years old, have been introduced. Since SAP the Government has also been promoting reduction of imports and the maximam use of domestic materials, restraining new investment and giving priority to rehabilitation and on-going projects.

2.2 Present Transportation System

Tanzania's transportation system handles not only domestic goods but products of neighboring countries, such as Zambia, Rwanda, Brundi and Zaire. Particulary, the system brings mineral products of Zaire and Zambia directly to Dar es Salaam port by railway trains,highway vehicles and inland sea carriers.

The present transportation system consists of roads extending 45,000 Km, three railways, three major ports and three international airports. A main roadblock to the system is the vast transportation cost and which cramps economic activities of Tanzania.

(1) Railways

The Tanzania Raiway Authority operates three lines extending 2,600 Km; the Dar es Salaam-Kigoma line, the Tanga-Arusha line and the branch line linking the two railway lines. The three railway lines transport agricultural products for export to the ports of Dar es Salaam and Tanga.

The collapse of the East Africa Community has made it impossible to use Kenya's repair factory and control system, causing a decrease in freight and passenger transportation of the railways. But passenger transportation in 1982 bounced back to the level in 1977.

Meanwhile, TAZARA (Tanzania Zambia Railway Authority) started operation in 1975. Administered jointly with Zambia , the railway connects Dar es Salaam to Kapiri Muposhi of Zambia, extending 970Km. Its freight transportation is smaller than expected, probably because of competition with the Tanzania-Zambia road and the heavy tie-ups at Dar es Salaam port. Passenger transportation is, however, on steady increase.

(2) Ports

Dar es Salaam, Tanga, and Mutowara, all the three are good natural coastal ports administered by the Port Authority. The port facilities of Dar es Salaam are relatively modern and they have adequate facilities to serve the needs of cargo handling. However Tanga and Mutowara ports are poorly equipped with loading and unloading facilities of cargo and containers.

(3) Airport

International airport are located in Dar es Salaam, Zanzibar and Kilimanjaro. Besides, Tanzania operates 50 domestic airports. Few of them have well-surfaced runways and the efficient aviation safety system.

In 1982, domestic passengers on flights of Tanzania Airline came to some 400,000. Of the total, Dar es Salaam accounted for 43% followed by Kilimanjaro with 13%, Rwanza 11% and Zanzibar 9%. Airports in major tourist areas handles as many as 80% of the overall passengers.

(4) Roads

Roads in Tanzania extend a total of 45,000 Km. The primary roads account for 9,300 Km, the secondary roads 7,700 Km and regional and district roads remaining 28,000 Km. 28% of the primary roads and 5% of the secondary roads are surfaced, representing a mere 7% of the total roads.

Since 1977, the Tanzanian Government has increased substantially budgetary appropriations for road works. Nevertheless, it had been unable to supply enough materials and equipment for road projects due to the second oil shock, runaway inflation and declining foreign currency reserves.

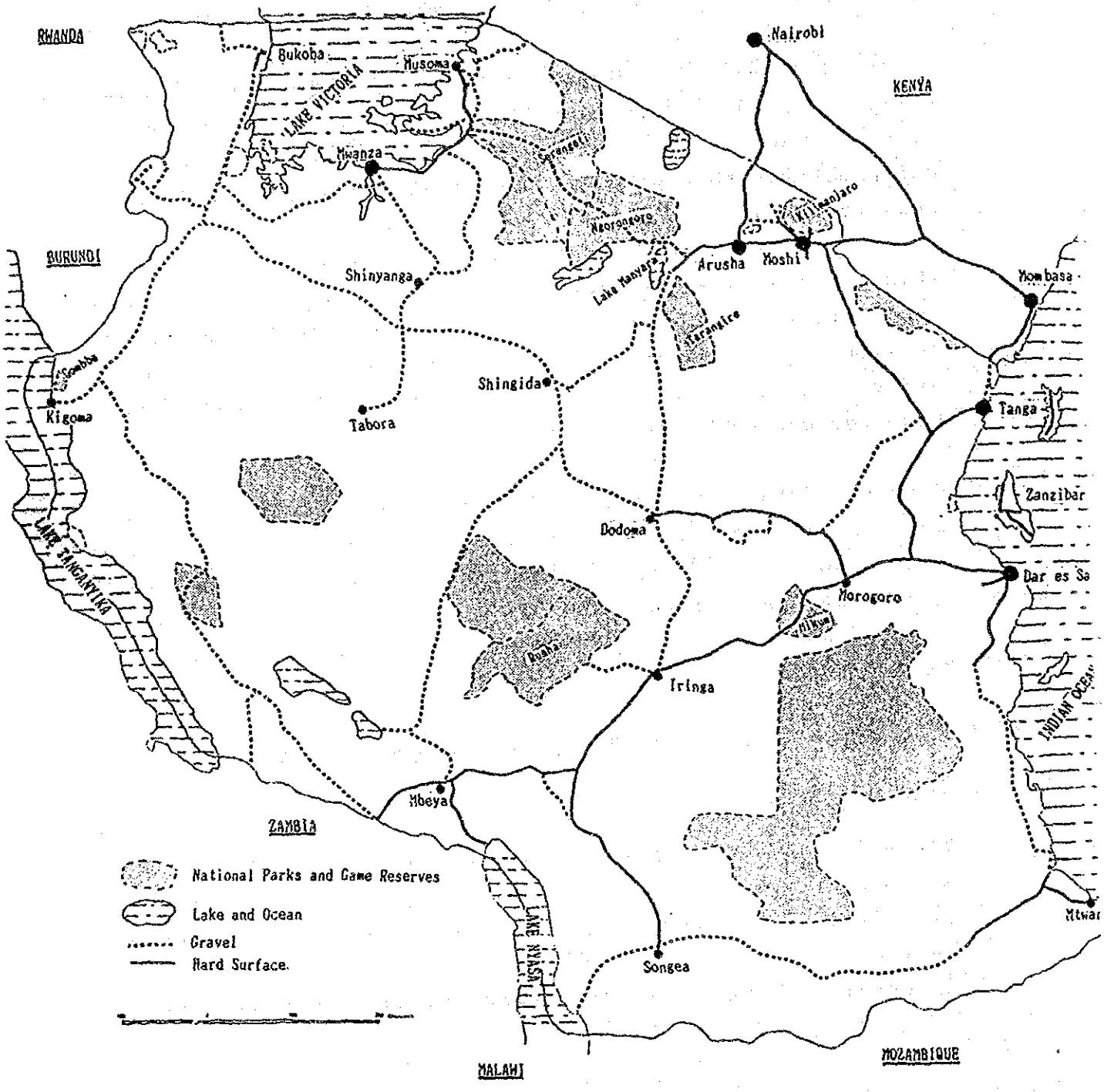
This has caused suspention of road improvement work and new road construction. The number of imported vehicles has declined due to strict import restrictions. Despite these unfavorable circumstances, Tanzania's road transportation has scored a moderate growth.

Bitumen-surfaced primary roads: from Tanga to Dar es salaam and Kibiti, and from Lindi to Mtwara on A1 road; from the Kenyan border to Makuyuni, and from Iringa to the Zambian border on the A2 road; almost all the sections on the A4 road; from Morogoro to Dodoma on the A5 road; and part of the A6 road.

Secondary and other roads are mainly paved with gravel and earth.

The existing conditions of above roads have deteriorated seriousely and average daily traffic(ADT) on the roads are relatively low. More than 500 vehicles of ADT are counted on the section of Dar es Salaam-Morogoro road, 300-500 are on Charinze-Tanga road and around Arusha on the A4 road.

Fig. 2.1 Trunk Road Network in Tanzania



2.3 Related Development Plans and Programs

2.3.1 National Development Plans

The Govenment of Tanzania has had five (5) National Development Plans since independence in 1961:

i) First 3-year Plan (1961-1964)
ii) First 5-year Plan (1964-1969)
iii) Second 5-year Plan (1969-1974)
iv) Third 5-year Plan (1976-1981)
v) Fourth 5-year Plan (1981-1986)

The fundamental purpose of the economic development plans up to the 1970s, was that the growth rate during the objective period should be over 6% annually, based on the principle of promotion of increased industrialization and agricultural production. In practice, however, the growth rates during the First, Second and Third 5-year Plans were only 5%, 4.8% and 0.4% respectively.

The Fourth 5-year Plan was suspended, and a National Economic Survival Program (NESP) was introduced in 1981. During the period 1982-1984, the Government further adopted the Structural Adjustment Program (SAP) with the objectives of; i) increasing production, especially agricultural preduction, ii) recovery of financial deficit and restriction of money supply, iii) promotion of exports and iv) equalization of income distribution.

However, the achievement of these objectives has so far been limited. The subsequent Economic Recovery Program(ERP) was launched in 1986 for the period 1986-1989. In the ERP, the target annual growth rate of GDP was established at 4-5% on average. While the actual output has been increasing at an average annual growth rate of about 3.7% providing for a 1% increase in income per capita. This fairly inpressive growth record was largely due to good performance of each industrial sectors under the execution of the ERP.

Despite the positive aspects of economic performance during the period of the ERP, there were areas where the Government has not been successful in achieving progress. The Economic Recovery Program (ERP) II or the Economic and Social Action Program (ESAP) has been established as a successor program to the ERP for the period 1989-1992 aiming of further sustenance and development of the major objectives and policies that were initiated in the ERP.

The major objectives of ERP II or ESAP are the following:

i) to increase domestic production of food and export;
ii) to restore efficiency in the mobilization and the utilization of domestic resources;
iii) to rehabilitate the physical infrastructure, in particular transport and communications in suport of directly productive activities;
iv) to restore international and external balances by pursuing appropriate fiscal, monetary and trade policies;
v) to reduce the rate of domestic inflation from about 28% in 1988/89 to below 10% in 1991/92;
vi) to revamp the industrial sector;
vii) to rehabilitate the social services by identifying and designing appropriate strategies and programs that would enhance peoples participation in the operation and management of these services.

2.3.2 Regional Development Plans

(1) Dar es Salaam Master Plan

a) Objectives

The primary objective of the Master Plan was the provision of a development program for the urban and surrounding region of Dar es Salaam. A further objective was to incorporate, where possible, recent planning projects and development program. In regard to the service component, the objective was to establish a program providing, adequate water, sewage, drainage, solid waste and electrical facilities to all exist

-ing and proposed developments at a minimum cost.

b) Strategies

The frame work of the Master Plan was on the population projections using available data upto the year 1978. The future population was projected to 2,461,000 people by the year 1999 within the future urban area. The employment projection has also been done.

The plan called for an overall reduction in the population density and improvement in the level of services available.

Land-use and public service facility plans were established and shown in Fig. 2.2.

c) Five Year Development Program

The Five Year Development Program for stage 1 deals specifically with priority projects requiring implementation in the Master Plan. The priority projects in the public services sector include water supply and distribution, sewage collection and disposal, electric supply and distribution and transportation.

In the transportation sector, 13 priority projects were identified and only three projects, i.e. Selender Bridge Widening, Morocco Road Extension to Kigogo and Morogoro Road Widening, have been completed.

(2) City Council Integrated Program

a) Objective of the Program

In order to increase the provision of essential services to the population as well as to rehabilitate those services which had deteriorated due to the lack of funds, the City Council prepared the Integrated Program in 1987.

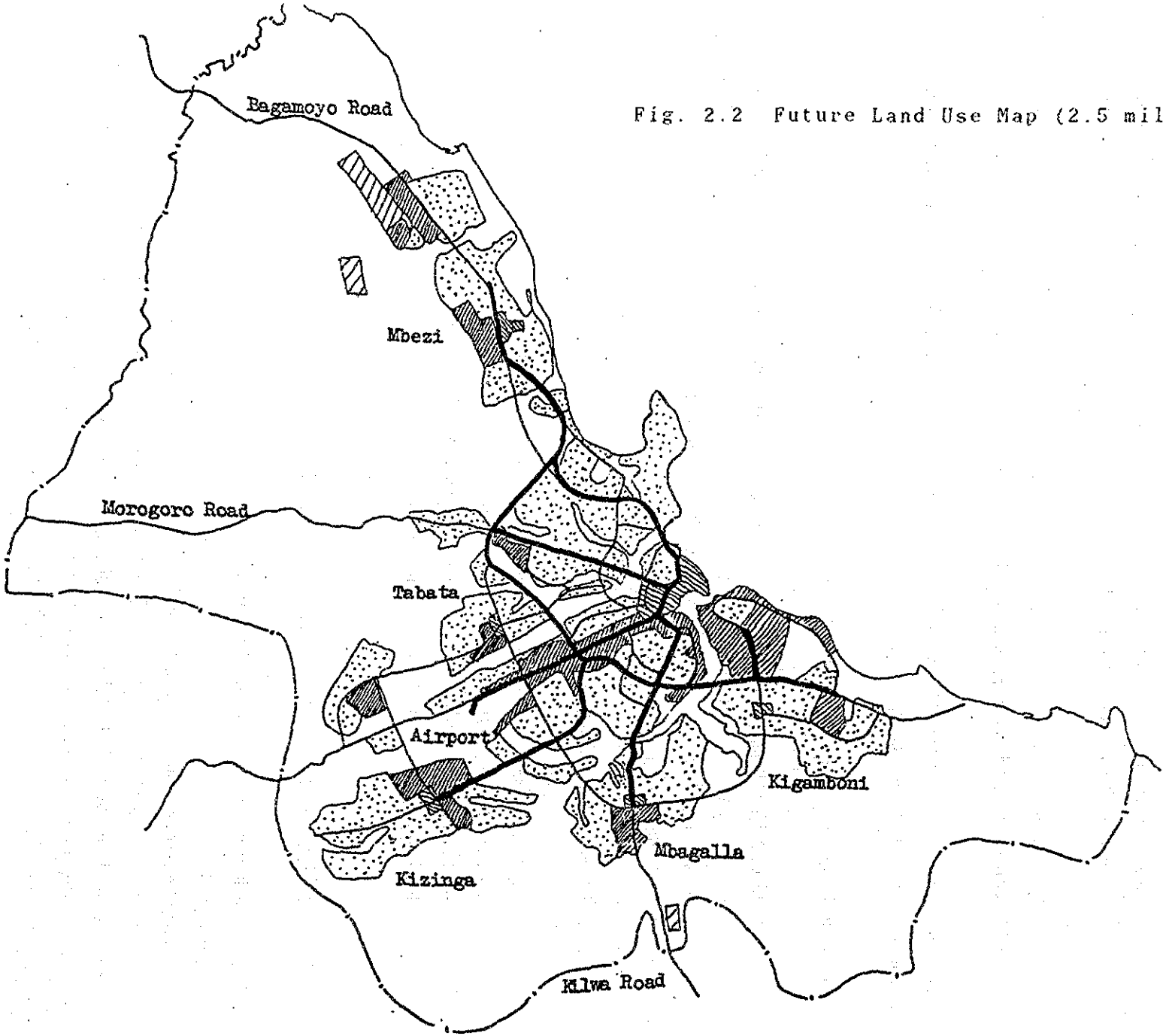


Fig. 2.2 Future Land Use Map (2.5 million population)

The objective of this program is to seek assistance in terms of financial aid, plants and equipment, expertise and training in the different sectors of the City Council so as to facilitate more balanced development in the City and to improve the present critical road and sanitation situation.

b) Integrated Program

In order to realize the above-mentioned city services, the following sectors, especialy Road Rehabilitation, are considered to require urgent redevelopment and rehabilitation. While the implementation of the Integrated Program prepared has been postponed generally due to lack of fund required.

Urgent Sector	Proposed Cost (million US$)
Public Work Sector	
-Rehabilitation of Roads	42.1
-Rehabilitation of the Storm Water Drainage	4.0
-Street and Traffic Lights redevelopment	1.6
-Rehabilitation of the Fire Brigade	0.6
-Rehabilitation and redevelopment of City Parks and Gardens	0.7
Public Health Sector	
-Disposal of refuse and waste	2.9
-Construction of three New District Hospitals	13.8
Rural Water Supply	
-Construction of shallow wells and Provision of piped water to village	0.8
Green Belt Development	
-Provision of farm inputs and equipment	7.0
Land Planning and Development	
-Provision of Survey Equipments	6.1
Grand Total	80.5

2.3.3 Dar es Salaam Road Improvement and Rehabilitation Plan

Followings are the premises and the contents of the Road Improvement and Rehabilitation Plan which was recommended by JICA in the Final Report on the Feasibility Study for Road Rehabilitation and Maintenance in Dar es Salaam in July 1990.

(1) Transport Projection

Table 2.1 shows the comparison of growth rate of actual 12 hrs. traffic on the Cordon-line, population, GDP and other data.

The annual growth rate of total traffic on the Cordon-line was 1.9% during 1982 and 1989 while the annual growth rate of GDP and population of Dar es Salaam was 2.0% and 4.8% during 1977-87 and 1978-88 respectively.

On the other hand it will be pointed that the recent progress of the economic recovery is remarkable and the annual growth rate of GDP and moter vehicles on roads prepared by the National Insurance Company was 3.5% and 3.6% during 1984-87 respectively.

Considering the recent progress of economic recovery and the future growth rate of population of Dar es Salaam, the future annual growth rate of economy by 2000 will be assumed as 4% in accordance with the projection of annual growth rate of GDP authorized in the Second Union Five Year Plan being 4-5% by 1993.

Thus the average annual growth rate of traffic on the Cordon-line will be around 4% for total traffic, 3% for cars and light goods vehiles, 10% for buses and 2% for trucks respectively, according to the elasticity analysis on the relations between each growth rates of traffic by tipes and the growth rate of GDP and population.

Table 2.1 Comparison of Traffic and Socio-economic Growth

Item		Existing Growth Rate (%/year)	Existing Period	Future Growth Rate (%/year)	Future Period
12hrs Traffic on the Inner Coedon Line	Cars & Light goods	1.4		4	
	Buses	11.0	1982-89	10	1989-2000
	Trucks	-1.1		2	
	Total	1.9		4	
Motor Vehicles on Roads		-0.7	1980-87		
		(3.6)	(1984-87)		
Population	Dar es Salaam	4.8	1978-88	5.0	1988-2000
	Tanzania	2.8	1978-88		
GDP		2.0	1977-87		
		(3.5)	(1984-87)	4	1989-2000

* figures in parenthesis show recent progress.

(2) Future Road Network

Traffic demand in Dar es Salaam is increasing year by year in accordance with the economic growth of Tanzania. Therefore if no improvement policies on the existing road facilities are applied, it is estimated that future traffic congestion will reach an unbearable level with congestion rate(C.R.) of over 1.5 on all roads in the urban area.

In order to support the economic activities and to realize smooth traffic movement, it is necessary to expand the road capacity in conjunction with increasing traffic demand and also to establish the basic policies for the implementation of the future road network.

Fig.2.3 shows the future road network to be improved under the short, middle and long term plans proposed. The proposed improve-ment measures for the establishment of the future road network are consisting of the following two measures; such as widening of

arterial roads and introduction of Grade Separation.

The proposed road to be widen from 2 to 4 lane roads during each implementation period are listed in Table 2.2. While the introduction of the grade separated intersection where the traffic volume will excess the traffic capacity of the at-grade intersection will be recommended to the specific five intersections under the Long-term Plan which are shown in Fig.2.3.

Table 2.2 Proposed Future Road Network to be widen from 2 lanes to 4 lanes

Implementation Plan	Road Name
Short-term Plan (1990-1994)	Strenghtening of Radial Arterial Roads -Upanga Road -Bagamoyo Road(from Selender Bri. to Morocco Rd.) -Morogoro Road(from Morocco Rd. to Port Access) -Uhuru Road
Middle-term Plan (1995-1999)	Strengthening of City-Center Streets (Establishment of Central Ring Road) -Sokoine Drive -Gerezani Street -Bandari Street -Ohio Street
Long-term Plan (2000-)	Establishment of New Middle Ring Road -Morocco Road -Extension of New Kigogo Road -Changombe road and its extension → New Middle Ring Road -Bagamoyo road(from Morocco Rd.to Mpakani Rd.)

Including other improvement measures proposed in the study, the detail component and expranation of the implementation plan on Road Improvement and Rehabilitation for short, middle and long terms are cralified in the Feasibility Study Report for Road Improvement and Maintenance in Dar es Salaam in July 1990 by JICA.

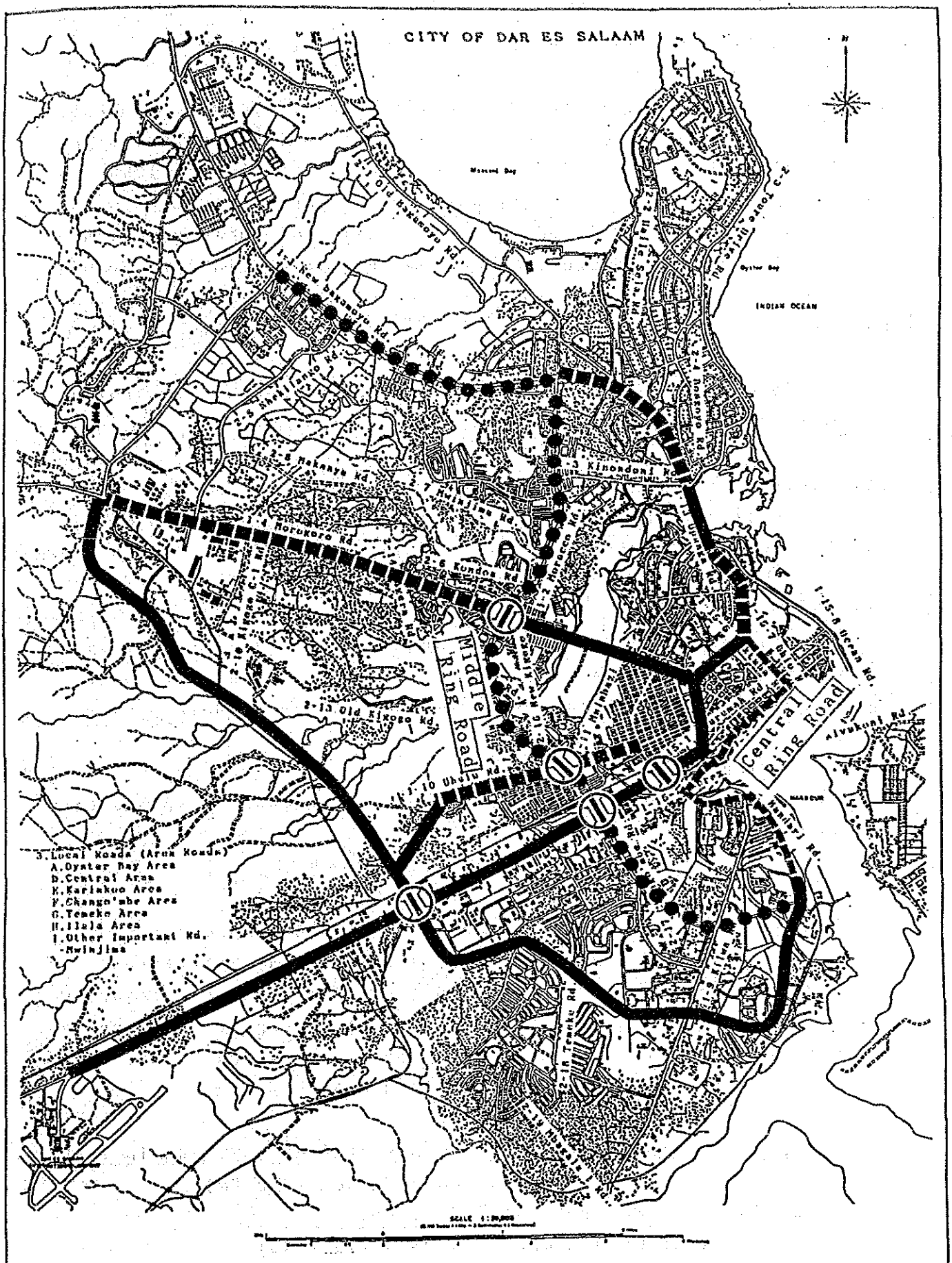


Fig. 2.3 Proposed Future Road Network

2.3.4 Outline of the Request

Based on the results of the Feasibility Study, the Government of Tanzania decided to implement these project which are consisting of the High Priority Projects in the short term plan in 1990 to 1995 proposed in the Feasibility Study and make a request to the Government of Japan to study the possibility of implementation of the Project under the provision of Japan's grant aid for the High Priority Projects of Road Improvement and Maintenance in Dar es Salaam.

The Project requested by the Tanzanian Government has the following main features.

(1) Title of the Project
The title of the Project is the "Road Improvement and Maintenance in Dar es Salaam".

(2) Objectives of the Project
The objectives of the Project are to improve existing road structures by overlay, reconstruction and widening to maintain the function of the road network in dar es Salaam City.

(3) Executing Agency
The executing agency of the Project is the Dar es Salaam City Council(DCC).

(4) The Project
The Project consists of three categories of improvement measures, namely Category A "Improvement of Road Structures", Category B " Urgent Repair of Selected Roads" and Category C "Improvement of Road Maintenance". The Category A is further divided into five (5) contract packages as shown below:
(Project Location is shown in Fi. 2.4.)

Category A "Improvement of Road Structures" (87.4 Km in Total)
- Lot No. A-1: New Bagamoyo/Upanga Roads (9.8 Km)
- Lot No. A-2: Morogoro Road (5.7 Km)
- Lot No. A-3: Chan'gombe Area Road (19.2 Km)
- Lot No. A-4: Kariakoo Area Road (31.7 Km)

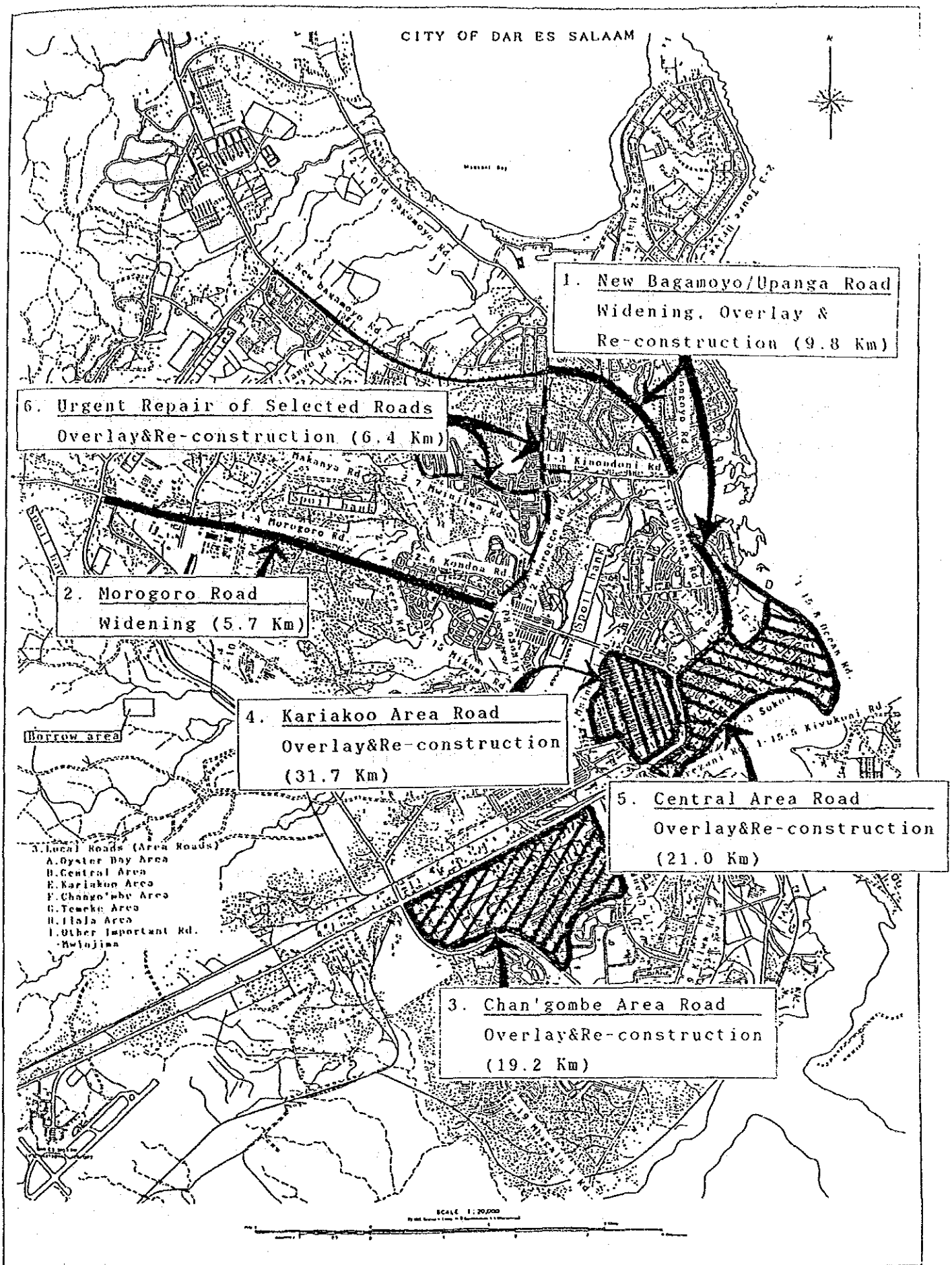


Fig. 2.4 Location of Project Roads Requested

- Lot No. A-5: Central Area Road (21.0Km)

Category B "Urgent Repair of Selected Roads

- Lot No. B-1: Morocco, Kinondoni and Mwinjuma Roads (6.4 Km)

Category C "Improvement of Road Maintenance System"

- Lot No. C-1: Procurement of Road Maintenance Equipment (the equipment requested by the Tanzanian Government is shown in Table 2.3.)

(5) Implementation Schedule of the Project

The Project will be implemented in line with the procedure and conditions of Japan's Grant Aid System. The tentative implementation schedule requested is as follows:

a) 1st Year: Detailed Design and Construction:
   - Lot A-5: Central Area Road
   - Lot B-1: Urgent Repair of Selected Roads of Morocco, Kinondoni and Mwinjuma roads
   - Lot C-1: Procurement of Road Maintenance Equipment

b) 2nd Year: Detailed Design and Construction:
   - Lot A-1: New bagamoyo/Upanga Road

c) 3rd Year: Detailed Design and Construction:
   - Lot A-2: Morogoro Road

d) 4th Year: Detailed Design and Construction:
   - Lot A-3: Chan'gombe Area Road
   - Lot A-4: Kariakoo Area Road

Table 2.3 Neccessary Equipment Requested

Items	quantity
1. 7 ton tipper tracks	5
2. LWB lorry with craine	1
3. Motor grader	1
4. Vehicles (Pick-up)	2
5. Bitumen sprayers	2
6. 2-tone vibrator-rollers	2
7. 2-tone dumpers	2
8. Wheel loader (0.4 cu.m)	1
9. Motor cycles	2
10. Asphalt cutters	2
11. Compresser (3.5 cu.m)	1
12. Mini back hoe (0.1 cu.m)	1
13. Tool boxes	5

CHAPTER 3 OUTLINE OF THE PROJECT AREA

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3.1 Characteristics of the Project Area

The Project Area covers the entire city of Dar es Salaam which also forms the Dar es Salaam Region, one of the 20 main land political regions of Tanzania and is the country's administrative, commercial and industrial center of Tanzania.

Dar es Salaam lies on a coastal plain with the Indian Ocean to the east and the Pugu Hills to the west. The coastal plain is traversed by a number of rivers, notably the Msimbazi and Mzinga Rivers, which divide the urban area.

The lowest average monthly temperature in Dar es Salaam is 23.3°C(July) while the highest average monthly temperature is 27.6°C(Feb.and March), with April being the most sultry with humidity of 82%. There are two rainy seasons, i.e. March-April and October-November, with annual rainfall of 1,000-1,100mm while the rest of the year being dry.

3.2 Socio-Economic Situations

3.2.1 Administration

The Project Area (City/Region of Dar es salaam) is divided into 3 administrative districts and 52 wards with the following data from the 1988 census.

-Temeke District:
Location: South of the city/Region
Area: 684 square kilometres
Population: 405,753
Households: *95,505/average of 4.2 people per household*
Wards: 16 wards

-Kinondoni District:

Location: North of the city/Region
Area: 501 square kilometres
Population: 621,389
Households: 143,669/average of 4.3 people per household
Wards: 18 wards

-Ilala District:

Location: Central part of city/Region
Area: 208 square kolimetres
Population: 333,708
Households: 75,130/average of 4.4 people per household
Wards: 18 wards

-City/Region

Location: East/Coast of Tanzania Mainland
Area: 1,393 square kilometres
Population: Total - 1,360,850
Urban - 1,103,983
Rural - 256,867
Households: 314,304/average of 4.3 people per household
Wards: 52 wards

The city Council is elected every 5 years under the universal suffrage system and consists of the Lord Mayor, Council Secretary, Deputy Mayor and the Chairman of each of the 10 departments.

The City Council services are provided by City Council staff of about 15,000, headed by the City Director and supported by 2 Deputy Directors (one for urban and one for rural areas) and 11 heads of departments. The Director reports to the Council and to the Principal Secretary of the Ministry of Regional Administration and Local Government.

Under the decentralisation of the City Council services, each district will have a fully fledged staff of similar qualifications to the Head Office.

Table 3.1 and Table 3.2 show the recurrent and development expenditure of the City Council budget for the period between 1983/84 and 1987/88.

The total recurrent expenditure of the City was 501.6 million T.Shs in 1987/88. The recurrent expenditure of the Engineering Department was 84.9 million T.Shs, approx. 16% of the total. The average share of the Engineering Department's expenditure was about 21% of the total expenditure in the period between fiscal 1983/84 and 1987/88.

The total development expenditure of the City during 1983/84 and 1987/88 was 216.4 million T.Shs, comprising approx. 12% of the total recurrent expenditure of the City which was 1,821.3 million T.Shs. in the same period.

Development expenditure for Road Construction/Rehabilitation constitutes and important position in the total development expenditure, sharing about 36% of the total during the period between fiscal 1983/84 and 1987/88.

Table 3.1 Recurrent Expenditure of DCC

	Recurrent Expenditure (T.Shs.000)		
Year	Total DCC	Engineering Dep.	(%)
1983/84	188,454.5	33,507.0	17.8
1984/85	357,923.9	118,146.0	33.0
1985/86	333,722.1	67,915.0	20.2
1986/87	437,614.7	70,893.1	16.2
1987/88	501,635.4	84,933.8	16.9
Total	1,821,349.6	375,394.9	20.6
Average Annual Increase Rate	28%	26%	-

Table 3.2 Development Expenditure of DCC

Year	Development Expenditure (T.Shs.000) Total DCC	Rd. Const.&Rehabili.	(%)
1983/84	10,812.0	5,135.0	47.5
1984/85	42,852.0	7,827.0	18.3
1985/86	22,606.0	6,802.0	30.1
1986/87	56,413.0	16,838.0	29.8
1987/88	83,780.0	40.640.0	48.5
Total	216,463.0	77,242.0	35.7
Average Annual Increase Rate	67%	68%	-

3.2.2 Population and Employment

(1) Population

Tanzania had a population of 12,3 million in 1967, 17,5 million in 1978 and 23,2 million in 1988. The average annual population increase rate declined from 3.2% in the period between 1967 and 1978 to 2.8% in the decade between 1978 and 1988 due to strengthen of birth control.

Table 3.3 shows the population of Dar es Salaam and Tanzania for 1967, 1978 and 1988. The Dar es Salaam's population of 356,000 in 1967 accounted for 2.9% of Tanzania's total population, incresing to 843,000 (4.8%) in 1978 and further to 1,361,000 (5.9%) in 1988.

As the results of the establishment of the Dar esSalaam Master Plan and the introduction of industrial decentralization, the growth rate of the Dar es Salaam's population has been decreasing, from 7.8% during 1967 and '78 to 4.8% during 1978 and '88 althogh it is still the highest growth rate among all the regions.

(2) Employment

The total employment in Dar es Salaam increased from 59,000 in 1976 to approximately 231,000 in 1988 with an annual growth rate of 6.4% while an annual growth rate of 6.7% was recorded for the employment of the mainland in the same period.

The trend of the employment/population ratio shows 17% in 1988 steady. The employment composition by sector is also analysed and the share of manufacturing and commerce has noticeably increased.

Table 3.3 Population of Dar es Salaam and Tanzania

	Population ('000)			Average Annual Growth Rate(%)	
	1967,(%)	1978,(%)	1988,(%)	1967-78	1978-88
Dar es Salaam	356 (2.9)	843 (4.8)	1,361 (5.9)	7.8	4.8
Tanzania	12,313 (100.)	17,512 (100.)	23,174 (100.)	3.2	2.8

Table 3.4 Existing Employment in Dar es Salaam and Tanzania

	Employment ('000)						Growth Rate
	1966	1979	1982	1983	1984	1988	1966-'88
Dar es Salaam	59	129	180	182	186	231	6.4%
Tanzania	-	457	632	633	633	-	6.7%
Employment/Population Ratio of Dar es Salaam	18%	15%	18%	17%	17%	17%	