

Dar es Salaam
Transport Policy and System Development
Master Plan

Technical Report 6
Traffic Survey & Analysis

June 2008

JAPAN INTERNATIONAL COOPERATION AGENCY

PACIFIC CONSULTANTS INTERNATIONAL
CONSTRUCTION PROJECT CONSULTANTS

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Dar es Salaam City Council
The United Republic of Tanzania

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Table of Contents

Chapter 1 Household Interview Survey

1.1	Scope of Work	1 - 1
1.1.1	Objective of the HIS	1 - 1
1.1.2	Survey Area covered by the HIS	1 - 2
1.1.3	Work Items	1 - 2
1.1.4	Survey Method	1 - 3
1.1.5	Products	1 - 8
1.1.6	Schedule	1 - 8
1.2	Transport Demand Characteristics	1 - 10
1.2.1	Socio-economic Profiles	1 - 10
1.2.2	Travel Demand and Characteristics	1 - 20
1.2.3	Origin and Destination of Trips	1 - 34

Chapter 2 Screen Line Survey

2.1	Scope of Work	2 - 1
2.1.1	Survey Locations	2 - 1
2.1.2	Survey Duration	2 - 1
2.1.3	Vehicle Classifications	2 - 1
2.1.4	Survey Method	2 - 4
2.1.5	Survey Forms	2 - 4
2.1.6	Staffing Indication	2 - 4
2.2	Survey Performance	2 - 6
2.3	Summary of Survey Result	2 - 9
2.3.1	Overall screen line traffic volumes	2 - 9
2.3.2	Characteristics by Location	2 - 10
	Appendix-2: Traffic Volumes by Hour and Location	2 - 16

Chapter 3 Cordon Line Survey

3.1	Scope of Work	3 - 1
3.1.1	Survey Locations	3 - 1
3.1.2	Survey Hours	3 - 4
3.1.3	Survey Days	3 - 4
3.1.4	Sampling	3 - 4
3.1.5	Interview Survey Items	3 - 4
3.1.6	Vehicle Types for Counting Survey	3 - 5
3.1.7	Survey Method	3 - 5

3.1.8	Survey Forms	3 - 6
3.1.9	Staffing Indications	3 - 6
3.2	Survey Performance	3 - 8
3.3	Summary of Survey Result	3 - 9
3.3.1	Traffic Volume	3 - 9
3.3.2	Average Occupancy	3 - 9
3.3.3	Number of Passengers	3 - 11
3.4	Development of Cordon Line OD Matrix	3 - 12
3.4.1	Methodology	3 - 12
3.4.2	Number of Passengers at Ports	3 - 12
3.4.3	Establishment of OD Matrix	3 - 14
Appendix-3.1: Traffic Volumes by Hour and Location		3 - 16
Appendix-3.2: Zanzibar Ferry Passenger Count		3 - 31
Chapter 4 Cargo Transport Survey		
4.1	Scope of Work	4 - 1
4.1.1	Survey Area	4 - 1
4.1.2	Survey Days	4 - 1
4.1.3	Survey Contents	4 - 1
4.1.4	Survey Method	4 - 2
4.2	Survey Performances.....	4 - 3
4.2.1	Sample Ratio and Expansion Factor	4 - 3
4.3	Survey Results	4 - 5
4.3.1	Company Profiles	4 - 5
4.3.2	Driver Profiles and Trip Information.....	4 - 8
Chapter 5 Travel Speed Survey		
5.1	Scope of Work	5 - 1
5.1.1	Survey Routes	5 - 1
5.1.2	Survey Hours	5 - 2
5.1.3	Survey Days	5 - 2
5.1.4	Survey Content	5 - 3
5.1.5	Survey Method	5 - 3
5.1.6	Survey Forms	5 - 4
5.2	Survey Results	5 - 6
5.2.1	GPS Log and Reason of Stops	5 - 6
5.2.2	Average Travel Speed	5 - 31
5.2.3	Major Congestion Points, Segments and Causes of Delay	5 - 37

Chapter 6 CBD Trip Generation Survey

6.1	Scope of Work	6 - 1
6.1.1	Survey Area	6 - 1
6.1.2	Survey Days	6 - 1
6.1.3	Survey Contents	6 - 2
6.1.4	Survey Method	6 - 2
6.2	Survey Performance	6 - 4
6.2.1	Land Use Inventory	6 - 4
6.2.2	Special Generator Attributes.....	6 - 5
6.2.3	Person Counts.....	6 - 6
6.2.4	Person Interviews	6 - 7
6.3	Estimation of Trip Generation in Survey Area	6 - 11
6.3.1	Trip Rate by Type of Building	6 - 11
6.3.2	Estimation of Total Trip in CBD	6 - 16

Chapter 7 Bus Passenger Opinion Survey

7.1	Introduction	7 - 1
7.2	Scope of Work	7 - 1
7.2.1	Survey Locations	7 - 1
7.2.2	Survey Hours	7 - 1
7.2.3	Survey Days	7 - 1
7.2.4	Sampling.....	7 - 2
7.2.5	Survey Method	7 - 3
7.2.6	Survey Forms.....	7 - 3
7.3	Survey Performance	7 - 3
7.4	Survey Result	7 - 4
7.4.1	Personal Attribute.....	7 - 4
7.4.2	Trip Information	7 - 8
7.4.3	Awareness on Bus Services.....	7 - 13
7.4.4	Preference to BRT/Dala dala.....	7 - 16
7.4.5	Binary Choice Model.....	7 - 18
Appendix-7: Survey Forms		7 - 22

Chapter 8 Car User Opinion Survey

8.1	Introduction	8 - 1
8.2	Scope of Work	8 - 1
8.2.1	Survey Locations	8 - 1
8.2.2	Survey Hours	8 - 2

- 8.2.3 Survey Days 8 - 2
- 8.2.4 Sampling 8 - 2
- 8.2.5 Survey Method 8 - 2
- 8.2.6 Survey Forms 8 - 3
- 8.3 Survey Performance 8 - 3
- 8.4 Survey Result 8 - 4
 - 8.4.1 Personal Attribute 8 - 4
 - 8.4.2 Trip Information 8 - 4
 - 8.4.3 Awareness of Buses..... 8 - 7
 - 8.4.4 Preference to BRT/Car 8 - 8
 - 8.4.5 Binary Choice Model..... 8 - 10
- Appendix-8: Survey Forms 8 - 14

Chapter 1 Household Interview Survey

1.1 Scope of Work

1.1.1 Objective of the HIS

(1) Household Interview Survey

The principal objective of HIS is to collect comprehensive information of the travel pattern and characteristics of the residents in the Study area. The survey also shall collect information of socio-economic characteristics of the sample households and individual household members as attributes of the trip information.

The interview items include in general:

- Household demographic information ;
- Household economic conditions (assets, housing type, household income, etc.);
- Individual attributes (social status, income, etc.) of each household members; and
- Trip information of each household member.

(2) Stated Preference Survey (SPS)

A supplemental interview to the selected household (a part of the HIS samples: 1,000 households in total) shall be made. There are three important elements that will be discussed based on the SPS.

1) Willingness to use new public transport mode (Bus Rapid Transit System)

SPS shall collect the information of people's willingness to use (or paying to) the existing and future public transport systems such as Bus Rapid Transit running along the Morogoro road. The existing car users and Dala-dala bus users are main target of this questionnaire survey.

2) No trip makers

SPS shall collect additional information of those who did not or could not make any trips on a designated day. Such person shall be identified during HIS. SPS shall collect his or her physical (bad access due to a heavy rain, etc) and non-physical constraints (urgent family issues, sick, day-off, no job, no money, etc.) or any other reasons that made him/her not to make the trips.

3) Traffic Demand Management

People's preference for traffic control and traffic demand management schemes such as parking charge, staggered working hour system, and vehicle numbering (coloring) system shall be collected through the SPS.

1.1.2 Survey Area covered by the HIS

As illustrated in Figure 1.1.1, the study area includes the whole area of Dar es Salaam City, which is composed of the three municipalities: Kinondoni, Ilala, and Temeke.

The population of the Study Area is estimated at about 3 million in 2007, and the total number of households is estimated at 0.6 million.

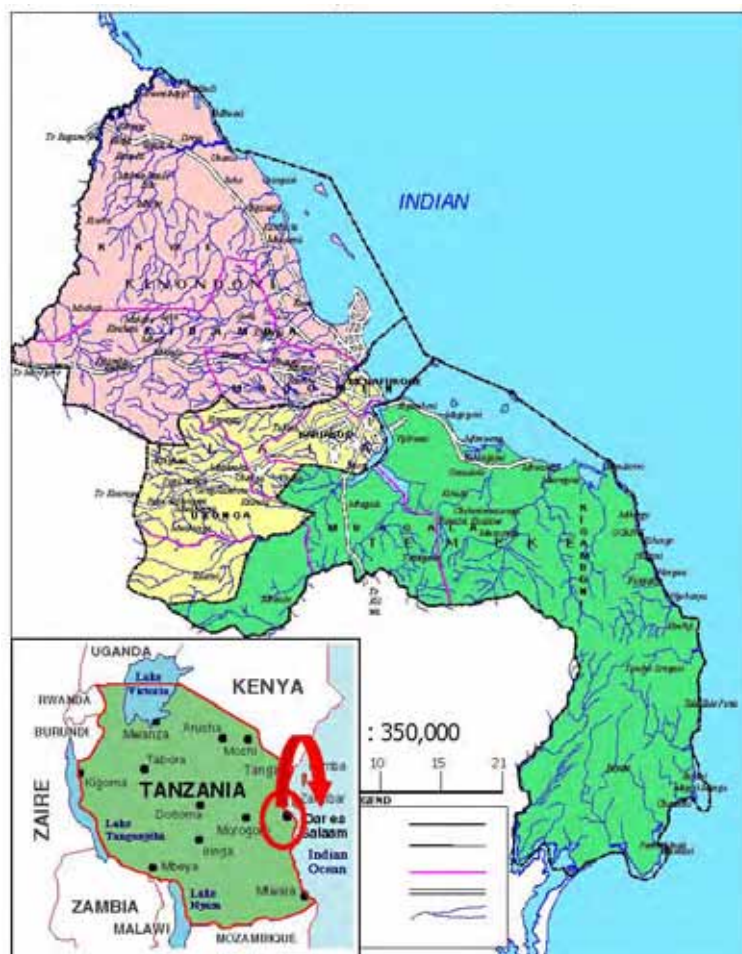


Figure 1.1.1 Study Area

1.1.3 Work Items

The survey works are composed of the following work items.

(1) Preparatory Works

- Site investigation (contact to head of each sub-ward to ask cooperation to the survey);

- Sampling (random selection of households to be surveyed) based on the national master sampling framework which is developed by Tanzania Bureau of Statistics (TBS);
- Preparation of survey forms;
- Preparation of survey zoning maps and tables indicating landmarks as reference for trip information (trip origin – destination data: OD data) coding;
- Public relation (advertisement by newspaper, poster, radio etc.);
- Recruiting of survey team members (supervisors, surveyors, editors and coders);
- Training of surveyors by the supervisors; and
- Organizing survey teams.

(2) Field Survey

- Conducting a pilot HIS by the supervisors as a part of training programs for the supervisors;
- Improvement of the HIS forms and survey team management system if necessary;
- Conducting the HIS in full-scale; and
- Periodic reporting to the JICA Study Team about the work progress.

(3) Data Processing

- Verification of the collected information by editors;
- Data coding (convert to traffic zone based information);
- Data input; and
- Validation of the information and logical error check.

1.1.4 Survey Method

(1) Sampling

Sampling method and the number of samples for the HIS

About 10,000 households (about 50,000 persons), shall be selected within the study area as the sample households through the “Random Sampling” technique. The random sampling should be done based on the National Master Sampling Framework used for National Census by TBS.

A HIS zone system (based on the enumeration block system by TBS, and which is prepared by the JICA Study Team) and the expected number of households to be sampled in each zone shall be given by the JICA Study team.

The number of samples for SPS

SPS will be administered to about 1,000 households immediately following HIS. The sampled households for SPS will be selected according to their answer of the HIS interview. The criteria for the selection of SPS target will be confirmed through the discussion with the Study team later.

(2) HIS Zoning System and Coding

HIS asks trip origin and destination information (OD information) of the residents. The location information of trip OD (expressed by address) should be converted into the HIS zoning system of this Study.

The consultant is requested to prepare a zone-coding table which includes identification (ID) numbers of the sub-wards, landmarks, name of roads crossing the zone, postal codes and any relevant information that can be used as a reference for identification of the HIS zoning system.

(3) Survey Team Organization and Required Performance

The consultant is expected to establish a survey organization depicted in Figure 1.1.2.

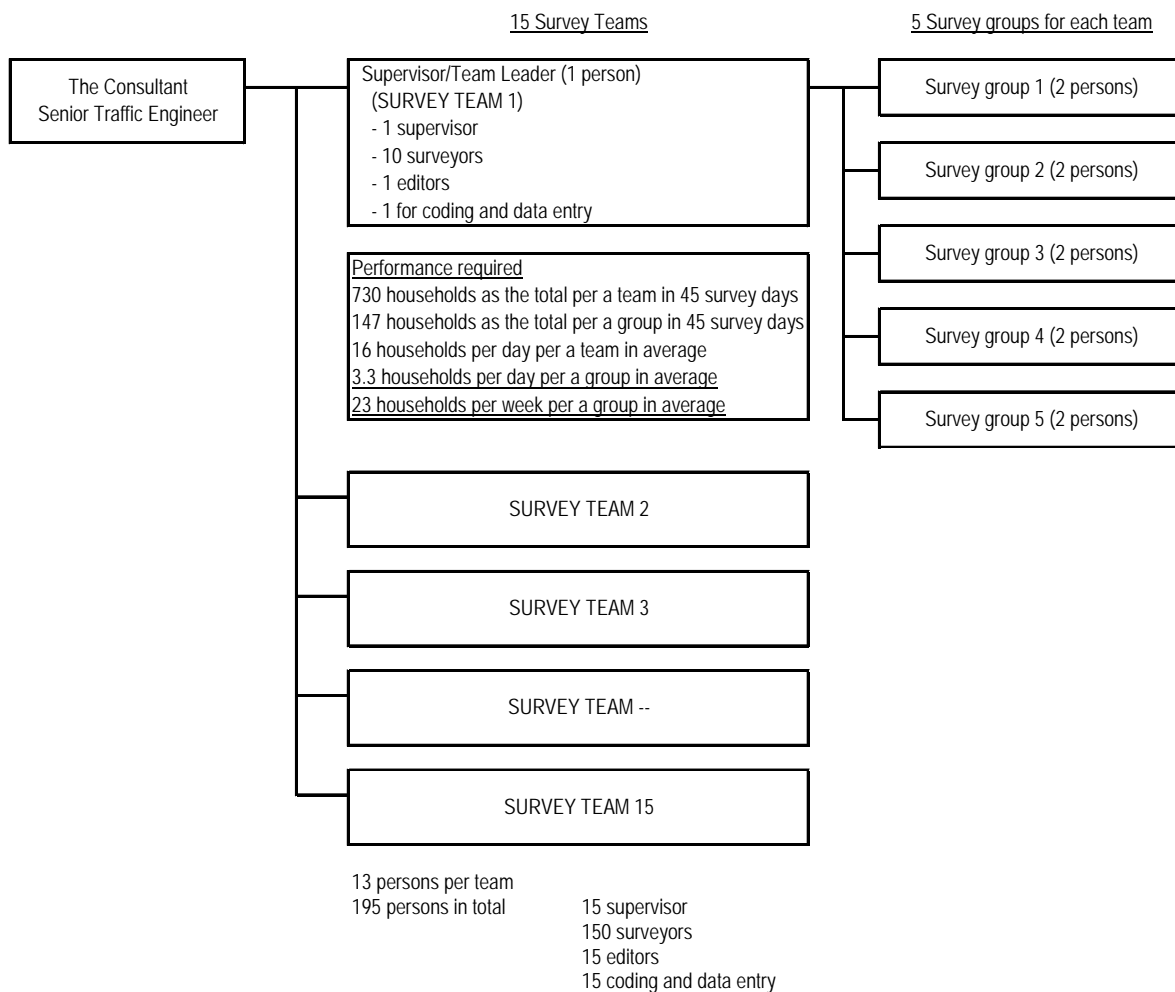


Figure 1.1.2 Survey Team Organization

The organization is composed of 15 survey teams and managed by the consultant in every aspect. Each survey team is composed of 13 persons in total, including 1 supervisor (team leader), 10 field surveyors, 1 data editor, and 1 data coding and entry person. In each survey team has five (5) survey groups, each of them is composed of 2 persons. The two persons of a group should work together in order to avoid

any security problems and other violations.

Each team should collect the information of 730 households in the 45 effective survey days, which indicates that each survey group (2 persons) should conduct the HIS of 23 households in a week in average.

The expected tasks of each study team member are described as follows:

- Senior Traffic Engineer of the Consultant (Project Manager)
He or she is fully in charge of HIS in terms of management of the survey.
- Supervisor (Team Leader)
A supervisor, as the leader of the survey team, control his/her surveyors and manage HIS in the field and associated work in the office. Periodical report should be made by the supervisors to the Senior Traffic Engineer of the Consultant (Project Manager).
- Surveyor
Surveyors are requested to visit the selected households to carry out the interview survey.
- Editor
Editors check the filled survey forms when they receive the forms from the surveyors. If they find any numerical and logical errors or missing items in the survey form, they will report this to the supervisor. The supervisors may ask the surveyors to re-visit the site to collect the true information.
- Coder
Address information of trip origins and destinations shall be converted into the HIS zoning system by the coders. Consequently the information shall be kept using commercial database software such as MS-Access.

(4) Survey forms

The Study team will provide the survey forms in English. The consultant is encouraged to discuss and improve the contents of survey forms and it is his duty to translate the survey forms into Swahili. The survey form includes the following items.

1) Form 1: Household Information

- Resident address;
- Number of household members;
- Number of vehicles of the household by type (vehicle ownership);
- Type of housing, number of rooms and ownership of living quarter;
- Monthly household income;
- Ownership of consumer durables (TV, microwave, etc.); and
- Electricity consumption (availability).

2) Form 2: Household Member's Information

- Occupation category by economic activity (types of job, school, etc.);
- Individual monthly income;
- Address (and/or landmark, building name) of working or school place;
- Availability of driving license;
- Car ownership;
- Expenses for the car use (fuel, parking, etc);
- Public transport expenses (bus and taxi);
- Working hour and holiday (or working day); and
- Number of trips on the survey day.

3) Form 3: Trip Information

- Origin place (address, landmark, building name, etc) and departure time of a trip
- Destination place (address, landmark, building name, etc) and arrival time of a trip
- Trip purpose
- Transport modes used during the trip, access/egress time, waiting time, travel cost, travel time and transfer point
- Car parking place and amount of parking fee, when the person drives a car.

4) Form 4: Opinions and Preferences

- Preference to new public transport mode.
- Preference to new traffic management scheme.
- Opinion on the current dwelling and transport condition (environment)

(5) Execution of the survey

Recruitment and training of survey teams

The JICA Study Team will provide an instruction manual in English to the consultant. Prior to the survey execution, manuals for survey instructions in Swahili should be prepared and submitted to the JICA Study Team for its review by the consultant. The JICA Study Team may give instructions to the consultant in preparing the manuals. Using this manual necessary training shall be given to the surveyors by the supervisors.

Permission and ID cards

The consultant should prepare official permissions and ID cards for the surveyors before the pre-survey and full-scale survey execution time. The surveyors must bring their ID cards when they visit the sampled household.

Management of the Surveys

To control the time schedule of the HIS is very important. The JICA Study Team will check the

schedule management system of the consultant as per necessity. The consultant is requested to directly manage the field survey, its quality and results. The consultant is requested to report the progress of the survey to the JICA Study Team every week.

The supervisors will check the survey activities every day and will double-check facts regarding the visit as well as content of the survey form by telephoning or re-visiting the sampled household and will regularly inspect the content of the survey forms.

Pilot survey

The pilot survey shall be conducted by the supervisors before the full-scale survey. The main purposes of the pilot survey are as follows.

- To know any difficulties of the survey that the surveyors may face with.
- To develop an effective training program for the surveyors.
- To check effectiveness of the survey forms (easiness to understand the questions by the interviewees).

The purpose of the pilot survey is not to obtain statistically valid information, but to optimize survey procedures and to complete the survey manuals for the surveyors. A group of two supervisors shall make a pilot survey with three different types of household, namely low-, middle- and high income households. So the pilot survey should entail about 20-30 households.

Given that the full-scale HIS is scheduled to commence in mid-May, the pilot survey should begin during the first week of May.

Field survey by surveyors

The surveyors are requested to visit each sampled household under the supervision of the team leader. The data shall be obtained through direct interviews with all the household members of more than 4 years old, but not through a delivery/collection method.

If a member of the household is absent when a surveyor visits a house, the surveyor should call back up to three times visits to complete the interview. Even three times call-back can not succeed to complete the interview of all members, a surveyor should select the next target household in order to satisfy the designated number of samples.

Public relations

The consultant is expected to carry out public relation activities through various media such as TV, radio, newspapers and specific pamphlets. Timing of the public relations should be prior to the full-scale HIS.

DCC and The JICA Study Team will support this public relation activities if necessary. The cost of using mass medias shall be included in the cost proposal by the consultant.

(6) Day of travel information

Travel information on a week day is necessary. Those of holidays and other day-off should not be accepted as effective data.

(7) Data Processing

Data processing should be started by other team members (data coding and entry persons) after one week from commencement of the field survey. The information collected in the field shall be coded and verified by the editors and coders. If the interview information is not satisfactory (judged by the editor), the submitted survey forms are returned to the survey team and the surveyors must visit the household again to collect appropriate answers.

For the data processing purpose, the consultant is requested to use MS-Access.

The JICA Study Team will provide a series of data error checking statements, which shall be interpreted into MS-Access language by the consultant. Using this error checking program, the consultant is requested to clean the HIS data before the last week of July 2007.

1.1.5 Products

At the completion of and during the survey, the following materials should be submitted to the JICA Study Team.

- Survey progress report (every week);
- Digital files of the survey data;
- Original survey forms collected from the field; and
- Summary performance report showing the number of sampled households and effective samples by HIS zone (draft and final).

1.1.6 Schedule

HIS survey schedule is shown as follow.

The final (clean) data should be given to the JICA Study Team in the form of CD-ROM before the last week of July, 2007.

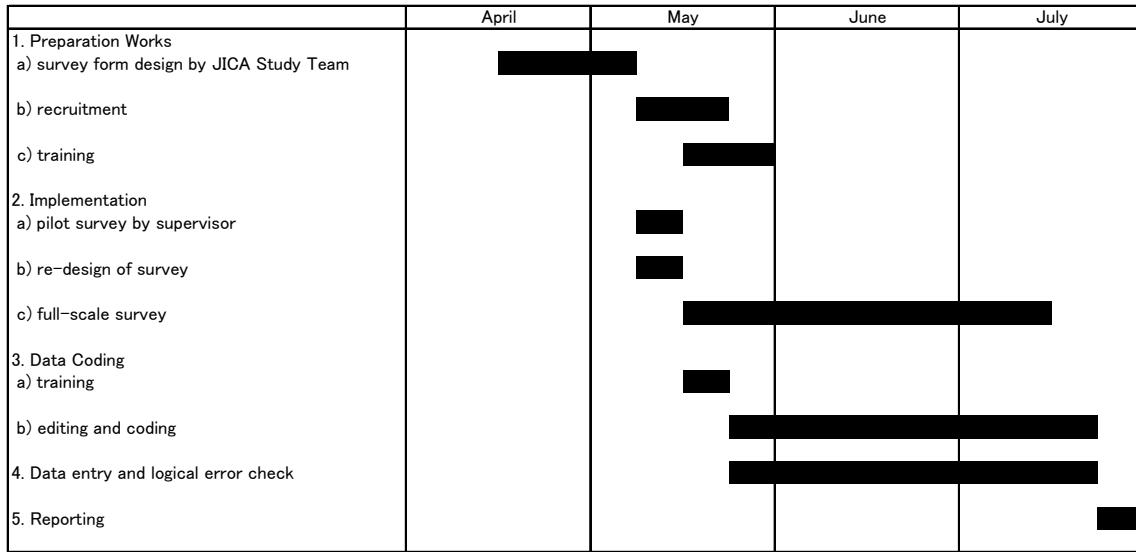


Figure 1.1.3 Survey Schedule

1.2 Transport Demand Characteristics

1.2.1 Socio-economic Profiles

(1) Demographic Features

The year 2007 total population in the Study area is estimated at 3,030 thousand: 1,297 thousand in Kinondoni district, 818 thousand in Ilala district, and 915 thousand in Temeke district respectively. The total number of households is estimated at 708 thousand based on the average household size obtained through HIS.

Table 1.2.1 Population and Households in the Study Area

District	Population (000)	Population 7 yrs old and above		No. of Households (000)	Average Household Size (persons)
		Male (000)	Female (000)		
Kinondoni	1,296.8	530.3	524.4	303.3	4.3
Ilala	817.8	312.4	316.1	186.4	4.4
Temeki	915.4	368.3	358.3	218.4	4.2
Study Area Total	3,030.0	1,211.1	1,198.8	708.2	4.5
Ratio (%)		50.3	49.7		4.3

Source: 2007 HIS by JICA Study Team

The age structure developed based on HIS is illustrated in Figure 1.2.1. The most dominant age group is that from 25 to 29 years old, representing 12% of the whole population. The ratio of working age group from 15 years old to 60 is estimated at 61.4%, while the ratio of old people of more than 60 years old is 3.1%.

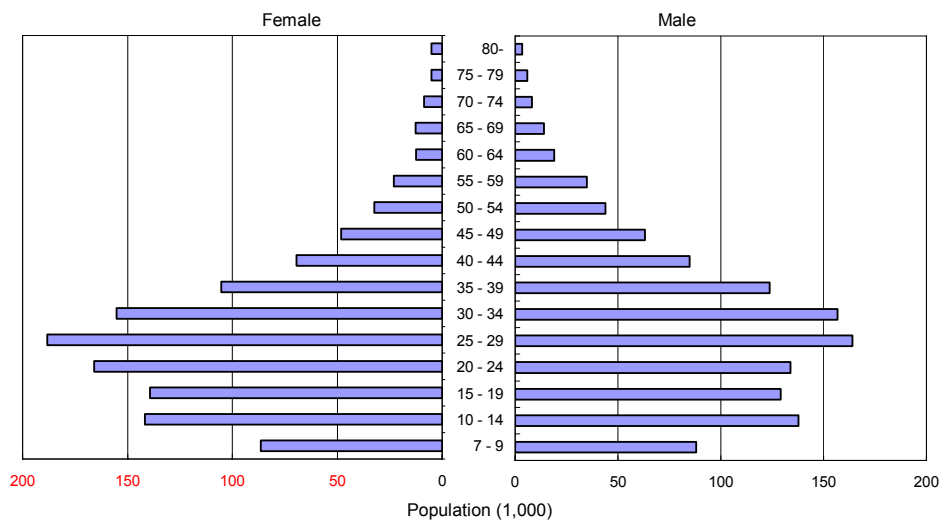


Figure 1.2.1 Population Age Structure

Figure 1.2.2 shows population structures by age group of year 2002 (National Census) and 2007(HIS). As illustrated there is no significant difference between the two, which indicates that the HIS sampling was properly conducted.

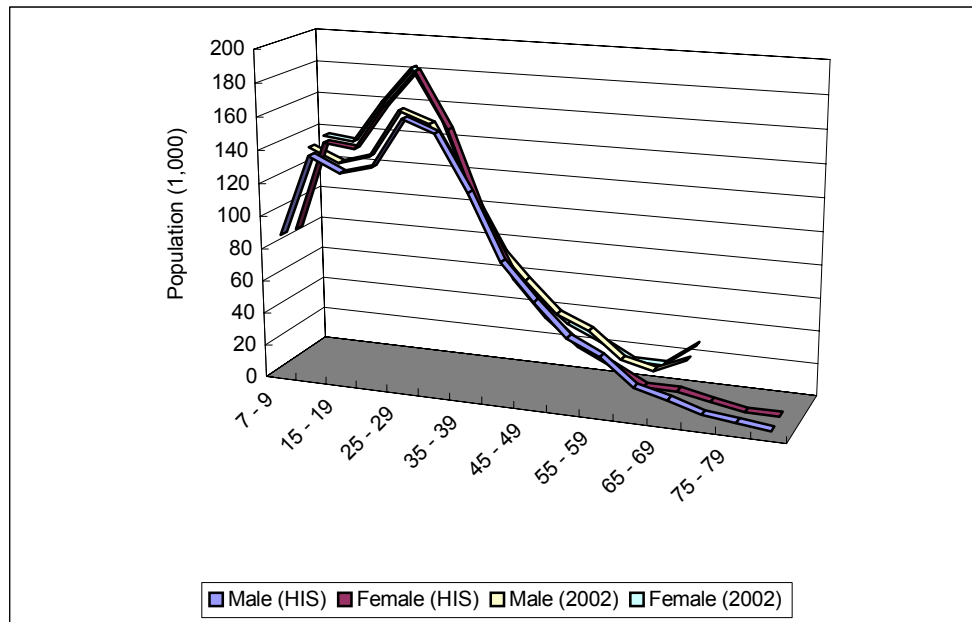


Figure 1.2.2 Changes from CENSUS in 2002

The gainful worker ratio, which is calculated by dividing the number of workers by the population of more than 15 years old and less than 60 years old, is estimated at about 48%. There observed significant difference between male and female in the gainful worker ratio.

The student ratio is estimated at 16.3% for male and 10.9% for female as shown in Table 1.2.2.

The ratio of “Jobless” which means “not working but looking for work”, indicates 7.9% for male and 6.5% for female.

Table 1.2.2 Population by Sex¹

	Male		Female		Total	
	Population (1,000)	Ratio (%)	Population (1,000)	Ratio (%)	Population (1,000)	Ratio (%)
Labor Force	934.7	100.0	926.8	100.0	1,861.5	100.0
Gainful Worker	629.8	67.4	259.2	28.0	889.0	47.8
Student	152.7	16.3	101.4	10.9	254.1	13.6
Housewife	15.6	1.7	421.6	45.5	437.2	23.5
Jobless	73.5	7.9	60.1	6.5	133.5	7.2
Others	63.1	6.8	84.6	9.1	147.7	7.9

Source: 2007 HIS by JICA Study Team

Table 1.2.3 shows economic activity by sex. In general males are more active than females.

¹ This table includes only population aged more than 15 and less than 60 years old.

Table 1.2.3 Economic Activity by Sex

	Male		Female		Total	
	Population (1,000)	Ratio (%)	Population (1,000)	Ratio (%)	Population (1,000)	Rate (%)
Legislators, administrators, and managers	19.5	1.6	5.4	0.4	24.9	1.0
Professionals	107.8	8.9	50.2	4.2	158.0	6.6
Tech. and associate professionals	40.8	3.4	6.0	0.5	46.7	1.9
Clerks	10.9	0.9	10.4	0.9	21.4	0.9
Small business managers	139.5	11.5	75.6	6.3	215.1	8.9
Service and shop sales workers	58.9	4.9	28.0	2.3	86.9	3.6
Street vendors	10.5	0.9	3.1	0.3	13.6	0.6
Craftsmen	29.2	2.4	3.2	0.3	32.4	1.3
Farmers	14.7	1.2	6.8	0.6	21.5	0.9
Livestock keepers	3.3	0.3	1.2	0.1	4.5	0.2
Fishermen	11.7	1.0	0.5	0.0	12.2	0.5
Plant operators, assemblers	8.1	0.7	1.5	0.1	9.6	0.4
Elementary occupations	23.3	1.9	7.2	0.6	30.5	1.3
Other working	168.6	13.9	64.2	5.4	232.8	9.7
Student (Elementary)	234.7	19.4	223.8	18.7	458.5	19.0
Student (Secondary)	109.1	9.0	77.9	6.5	187.0	7.8
Student (University/ institute)	18.9	1.6	12.8	1.1	31.7	1.3
Student (Others)	13.2	1.1	10.0	0.8	23.2	1.0
Not working but looking for work	73.9	6.1	60.6	5.1	134.5	5.6
Not working but not looking for work	22.6	1.9	30.4	2.5	53.0	2.2
Home maker, housewife	17.2	1.4	433.4	36.2	450.7	18.7
Retired/ too old, pensioner	36.6	3.0	30.0	2.5	66.6	2.8
Unable to work	4.7	0.4	6.8	0.6	11.5	0.5
Others	33.2	2.7	49.8	4.2	83.0	3.4
<i>Total</i>	<i>1,211.1</i>	<i>100.0</i>	<i>1,198.8</i>	<i>100.0</i>	<i>2,409.9</i>	<i>100.0</i>

Source: 2007 HIS by JICA Study Team

Figure 1.2.3 illustrates the year 2007 population distribution by ward (upper figure) and by aggregated analysis zone (16 super zones for analysis purpose). This figure clearly indicates that majority of the people live within 15 km radius of the western part of Dar es Salaam. Some large population are observed along the coast in the north. A small population is observed in the eastern part of Dar es Salaam such as Kigamboni and Kimbiji.

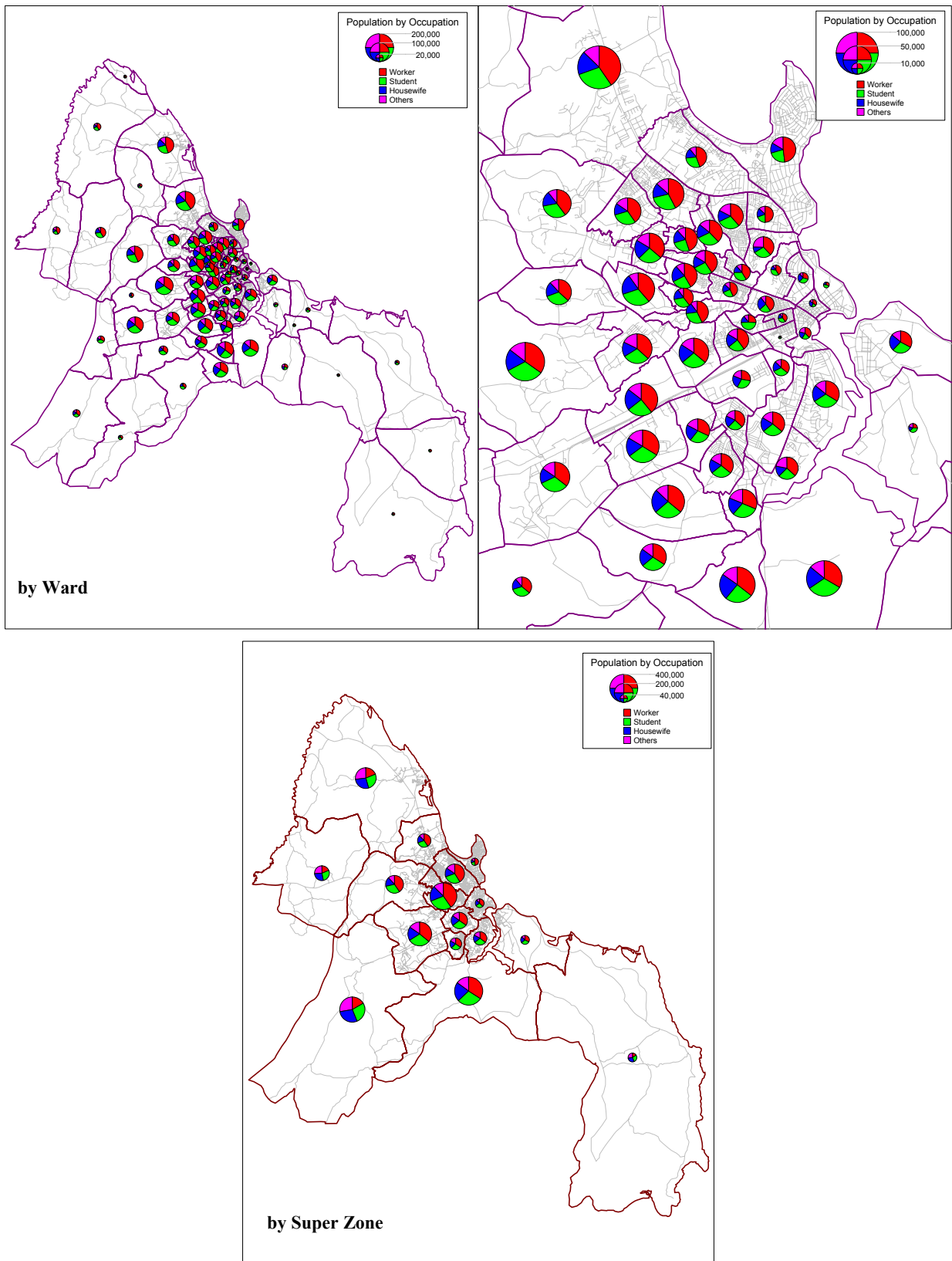


Figure 1.2.3 Population Distribution in 2007

(2) Day/Night Ratio

Table 1.2.4 shows the year 2007 population distribution by social group and activities (job and school) by the super zone.

The “Day / Night Ratio” in Table 1.2.4 is defined as follows:

$$\text{Day/Night Ratio} = \frac{\text{Working (student) population at work (school) place}}{\text{Working (student) population (=residents) at resident place}}$$

A very high day/night ratio of working population is calculated in the Central area, which includes Kisutu, Kariakoo, and Kivukoni, followed by Nyerere and Msasani area.

Similar to the working day/night ratio, a high value is observed in the Central area, and followed by Ubungo area in which Dar es Salaam University is located.

Table 1.2.4 Population Distribution by Super Zone

Super Zone	Population 7yrs and above (1,000)	Working Population			Student Population			
		at Resident Place (1,000)	at Work Place (1,000)	Day/Night Ratio	at Resident Place (1,000)	at School Place (1,000)	Day/Night Ratio	
							Elementary and Secondary	Superior
Central area	60.0	22.6	201.7	8.94	16.6	66.7	3.74	5.85
Msasani area	40.7	19.5	22.8	1.17	9.1	7.0	0.74	1.18
Bagamoyo corridor	217.8	89.6	92.3	1.03	61.6	50.1	0.85	0.50
Morogoro corridor	365.8	147.6	94.1	0.64	104.5	91.9	0.89	0.64
Nyerere corridor	141.8	49.1	71.3	1.45	42.3	39.4	0.92	1.07
Temeke area	96.8	33.6	35.8	1.07	26.8	29.9	1.16	0.81
Kilwa corridor	114.4	40.5	38.7	0.95	33.0	33.2	0.99	1.08
Kigamboni area	52.5	16.8	13.4	0.79	16.6	14.8	0.94	0.18
Kawe area	102.6	41.5	21.5	0.52	29.8	29.4	1.04	0.18
Ubungo area	166.4	67.5	60.2	0.89	51.2	52.5	0.95	1.52
Tabata area	312.4	112.1	75.9	0.68	94.2	72.8	0.80	0.40
Outer south	397.8	135.2	67.8	0.50	114.8	99.7	0.89	0.68
Outer north	104.8	45.2	39.5	0.87	27.7	31.1	1.14	0.70
Outer west	56.8	23.5	18.2	0.77	16.6	20.7	1.31	0.19
Outer southwest	156.6	57.3	41.0	0.71	48.7	46.7	0.96	0.86
Outer southeast	22.9	8.5	8.3	0.98	7.0	7.1	1.02	1.00
<i>Total</i>	<i>2409.9</i>	<i>910.1</i>	<i>902.4</i>	<i>0.99</i>	<i>700.5</i>	<i>692.9</i>	<i>0.99</i>	<i>0.99</i>

Source: 2007 HIS by JICA Study Team

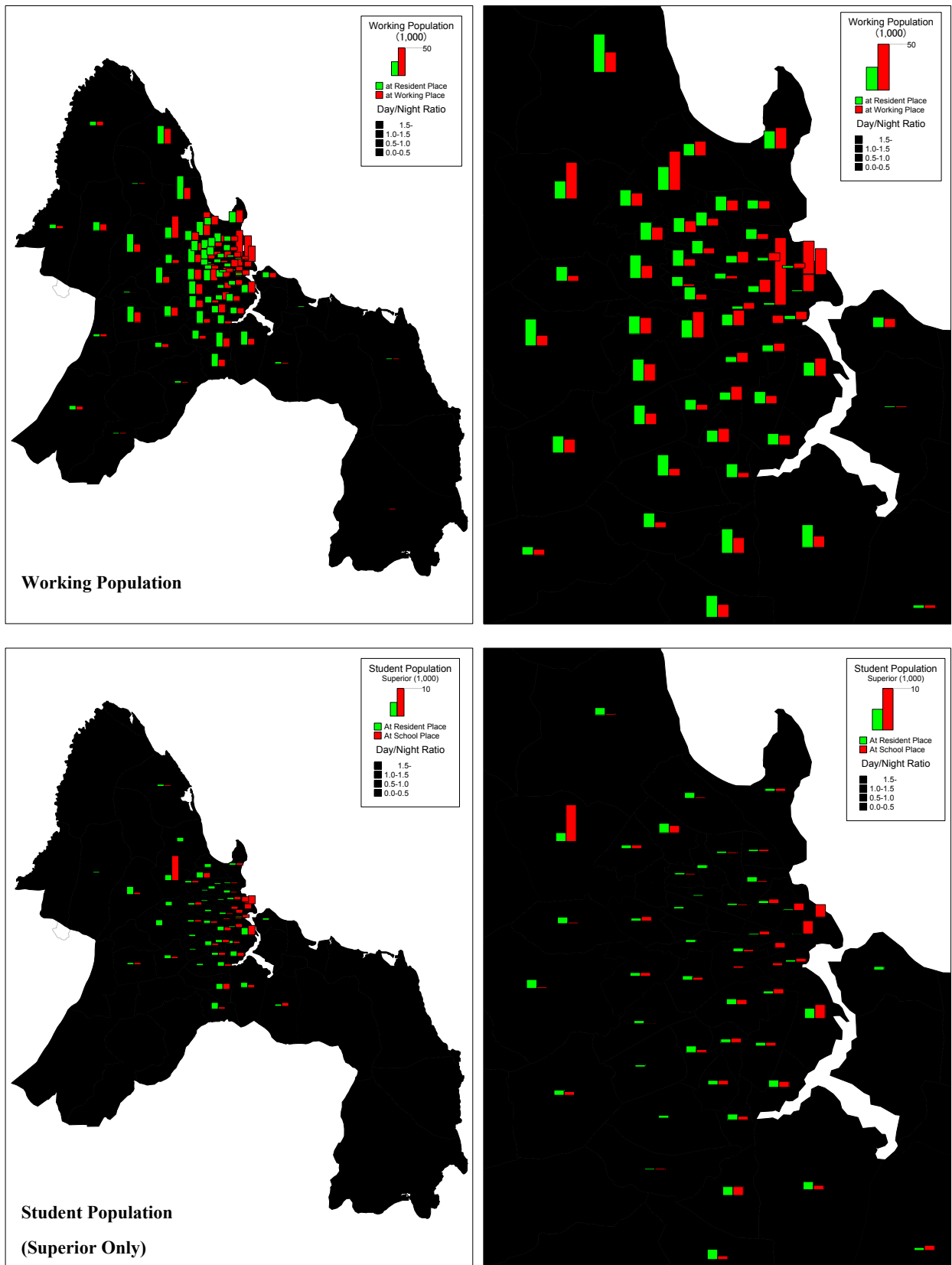


Figure 1.2.4 Day / Night Population by Ward

(3) Housing Conditions

A relatively low house ownership rate is seen in the central area, while higher rates are observed in the Msasani and Bagamoyo corridor area. In other areas, the ownership rates are around 50%.

Regarding the construction material of houses, majority of the houses are made of blocks, while in the outer southeast those are mainly made of Mud/Wood.

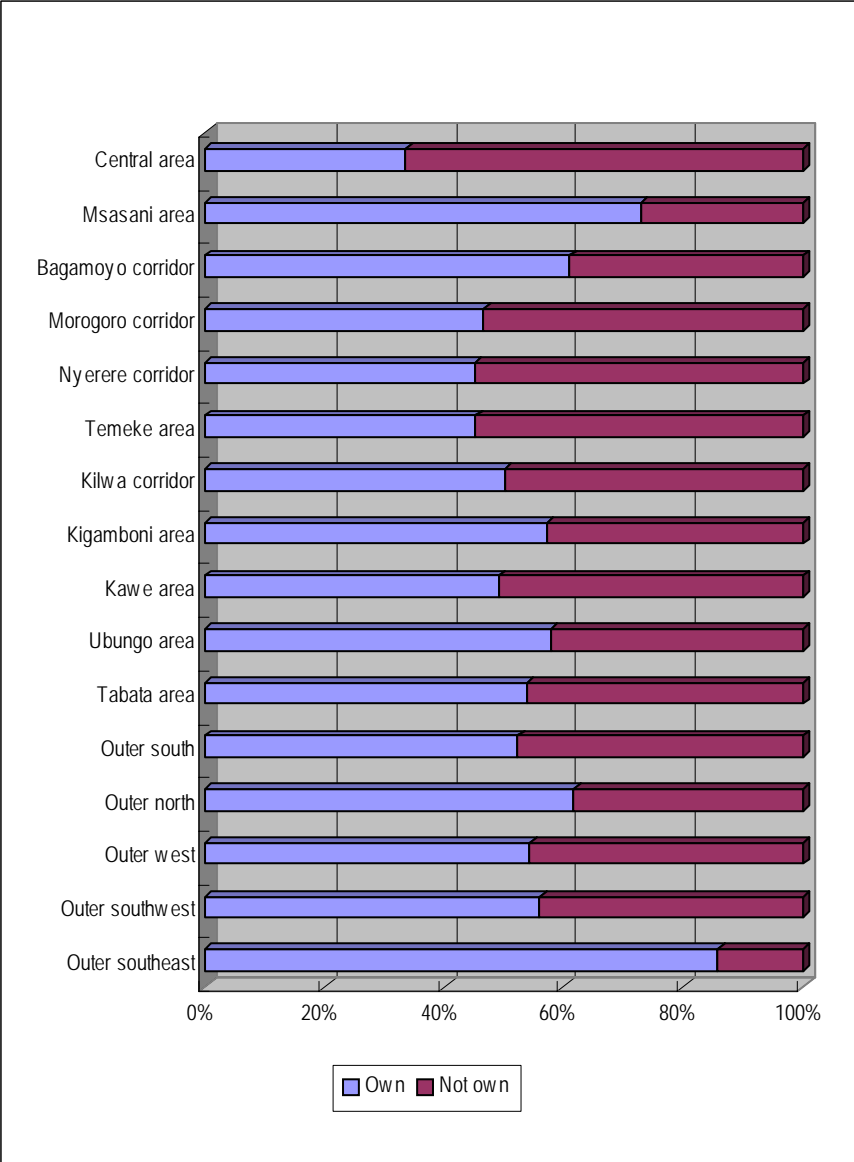


Figure 1.2.5 Ownership of House

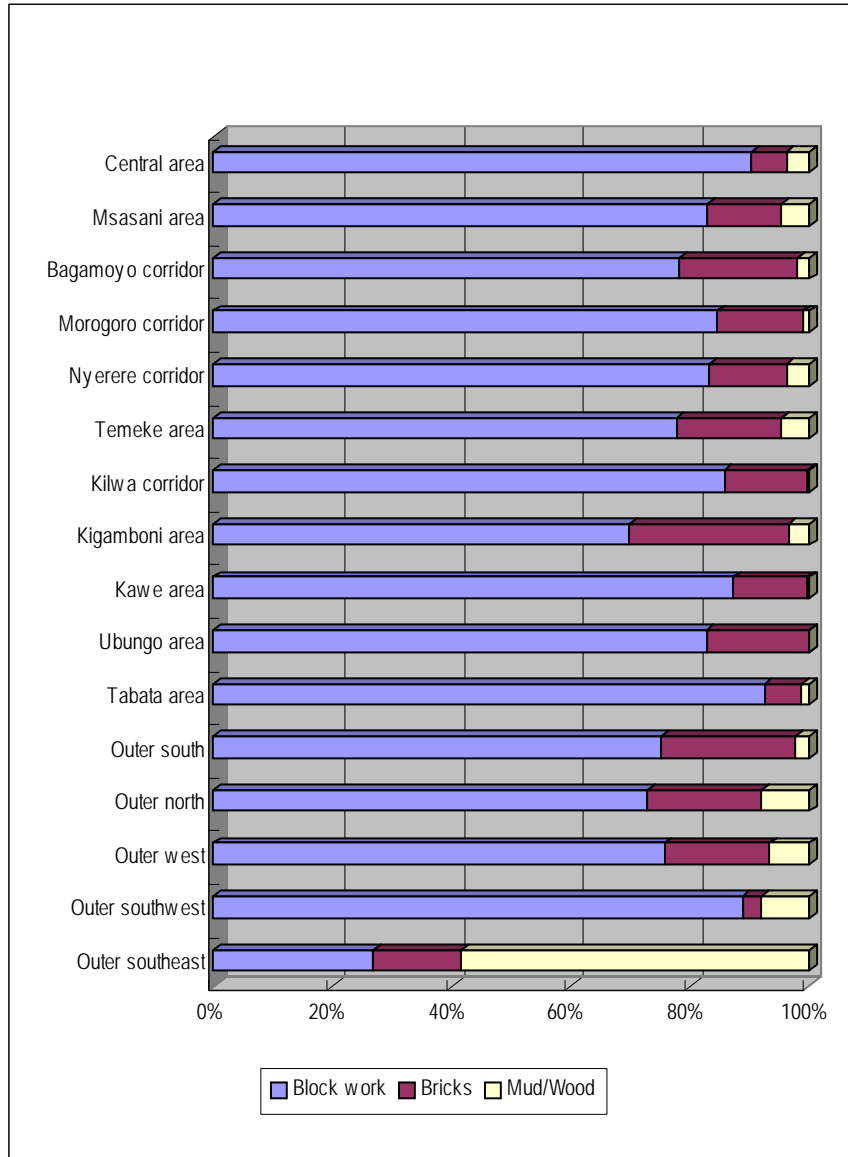


Figure 1.2.6 Construction Material of House

(4) Ownership of Durable Goods

Table 1.2.5 shows ownership of durable goods by the super zone. The ownership rates of radio and mobile phone are rather high, 80.2 % for the radio and 78.6% for the mobile phone as a whole. While, those of washing machine, computer and internet availability are quite low.

Table 1.2.5 Ownership of Durable Goods

Super Zone	Refrigerator	Washing machine	Air Conditioner	Radio	TV	Satellite TV	Camera	Video tape recorder	DVD player	Telephone	Facsimile	Mobile phone	Computer	Internet availability
1 Central area	69.5	17.1	32.7	88.6	83.8	24.9	30.3	41.2	40.4	29.5	6.0	87.9	33.0	12.6
2 Msasani area	55.8	2.4	13.5	84.7	74.4	13.0	12.5	23.9	29.7	16.8	0.0	68.6	23.3	7.5
3 Bagamoyo corridor	61.2	2.8	7.8	86.2	80.0	6.6	10.5	21.8	25.7	11.2	0.9	81.4	12.5	3.0
4 Morogoro corridor	53.4	1.6	4.0	84.9	71.4	9.9	9.2	21.0	20.2	7.0	0.6	81.3	6.7	1.4
5 Nyerere corridor	43.0	1.4	4.9	74.8	58.8	10.1	9.2	15.7	16.1	7.2	1.5	80.4	4.4	0.8
6 Temeke area	33.7	1.1	3.0	69.7	53.9	5.4	3.7	10.0	10.5	1.8	0.6	75.2	4.0	0.3
7 Kilwa corridor	50.5	0.7	4.7	82.4	66.8	10.0	5.8	16.6	19.4	6.9	0.0	83.0	5.8	1.6
8 Kigamboni area	34.7	0.0	1.7	79.1	55.0	1.7	5.6	6.5	10.7	6.0	0.0	73.3	5.4	1.0
9 Kawe area	58.6	5.2	10.8	86.1	74.6	20.0	18.8	30.2	31.4	11.9	0.0	87.4	17.7	3.3
10 Ubungo area	69.4	2.5	5.9	87.2	80.2	16.2	13.3	27.8	29.7	12.0	0.8	85.6	13.5	1.8
11 Tabata area	47.0	1.5	4.8	83.1	58.5	8.2	12.6	20.2	18.3	6.5	0.5	81.4	7.3	1.3
12 Outer south	29.8	0.1	1.7	69.8	49.0	5.8	3.7	7.5	8.5	4.5	0.8	73.4	2.7	0.5
13 Outer north	29.0	1.0	4.1	79.6	42.5	3.8	7.0	13.2	11.5	4.9	0.3	66.7	5.0	0.9
14 Outer west	50.5	2.1	3.8	80.2	62.9	9.3	7.9	20.3	17.5	5.6	0.4	79.2	7.0	2.1
15 Outer southwest	31.3	0.2	2.8	79.5	39.6	5.0	6.1	13.9	11.4	1.6	0.0	75.1	3.0	0.7
16 Outer southeast	4.8	0.0	2.7	59.0	5.0	2.7	0.0	1.1	1.1	0.0	0.0	37.5	1.1	0.0
<i>Total</i>	<i>46.0</i>	<i>1.8</i>	<i>5.2</i>	<i>80.2</i>	<i>61.6</i>	<i>8.9</i>	<i>9.2</i>	<i>17.8</i>	<i>18.2</i>	<i>7.4</i>	<i>0.7</i>	<i>78.6</i>	<i>7.8</i>	<i>1.7</i>

Source: 2007 HIS by JICA Study Team

(5) Vehicle Ownership

Table 1.2.6 and 1.2.7 shows vehicle ownership of Dar es Salaam residents estimated from HIS. A total of 68,600 households, which is about 10% of the total household, have one or more cars. The total number of passenger cars plus pick-ups is estimated at 77.8 thousand vehicles in 2007, in other words it is 25.9 vehicles per 1,000 people. The ownership of motorcycle is lower than that of cars: 30.8 thousand household or 4.5% of the total households. The bicycle ownership is slightly higher than others: 104.9 thousand or 15.4 % of the total.

Table 1.2.6 Number of Vehicles Owned

Type of Vehicle	No. of Cars Owned (1,000)
Bicycle	106.6
Motorcycle	31.9
Passenger car	45.1
Pick-up, van	32.7
Truck	4.6

Source: 2007 HIS by JICA Study Team

Table 1.2.7 Vehicle Ownership

		Kinondoni		Ilala		Temeke		Study Area Total	
		No. of H/Hs (1,000)	Rate (%)	No. of H/Hs (1,000)	Rate (%)	No. of H/Hs (1,000)	Rate (%)	No. of H/Hs (1,000)	Rate (%)
Bicycle	No owning	252.7	84.9	151.6	83.4	177.0	85.6	581.3	84.7
	1 owning	44.3	14.9	29.5	16.2	29.9	14.4	103.7	15.1
	2 or more	0.6	0.2	0.6	0.3	0.0	0.0	1.2	0.2
	<i>Total</i>	<i>297.6</i>	<i>100.0</i>	<i>181.7</i>	<i>100.0</i>	<i>206.9</i>	<i>100.0</i>	<i>686.2</i>	<i>100.0</i>
Motorcycle	No owning	284.0	95.4	170.4	93.8	201.0	97.1	655.4	95.5
	1 owning	13.5	4.5	11.1	6.1	5.8	2.8	30.4	4.4
	2 or more	0.1	0.0	0.2	0.1	0.1	0.0	0.4	0.1
	<i>Total</i>	<i>297.6</i>	<i>100.0</i>	<i>181.7</i>	<i>100.0</i>	<i>206.9</i>	<i>100.0</i>	<i>686.2</i>	<i>100.0</i>
Car	No owning	260.0	87.4	161.5	88.9	196.0	94.7	617.6	90.0
	1 owning	29.2	9.8	17.0	9.3	10.4	5.0	56.6	8.2
	2 or more	8.4	2.8	3.1	1.7	0.5	0.2	12.0	1.8
	<i>Total</i>	<i>297.6</i>	<i>100.0</i>	<i>181.7</i>	<i>100.0</i>	<i>206.9</i>	<i>100.0</i>	<i>686.2</i>	<i>100.0</i>

Source: 2007 HIS by JICA Study Team

Figure 1.2.7 shows the relationship between the vehicle ownership and the monthly household income level. About 56% of households in the highest income level group (more than 2 million Tshs. Per month) have one or more cars. There is a sudden increase in the vehicle ownership at the income level of 500,000 Tshs. per month.

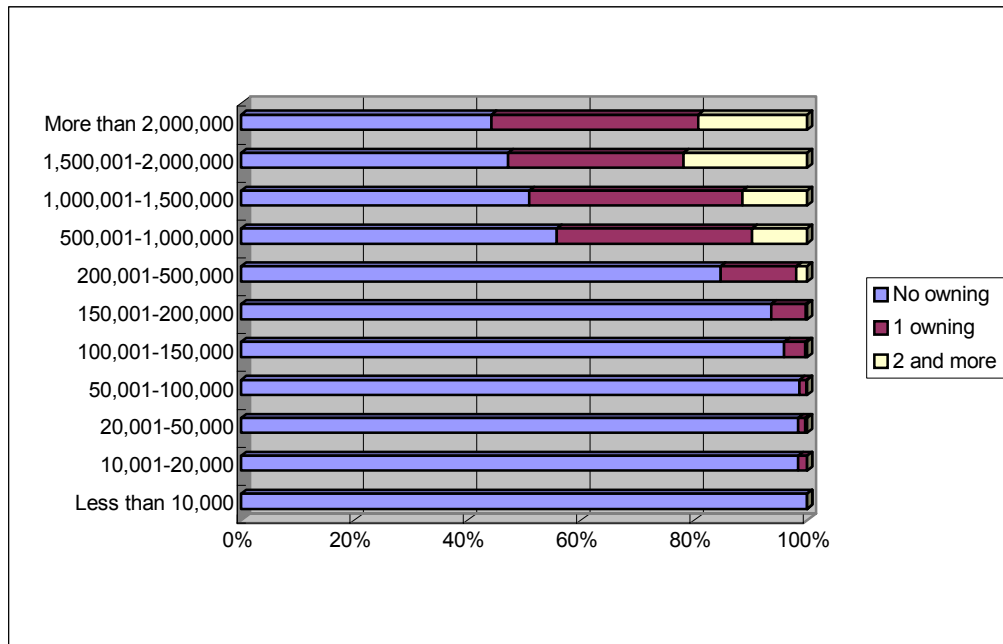


Figure 1.2.7 Vehicle Ownership by Household Income Level