

**REPORT ON INVESTIGATION
OF DAR ES SALAAM'S
INSTITUTIONAL ACTIVITIES
RELATED TO CLIMATE CHANGE**
WORKING PAPER February 2012

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1 Introduction



1.1 Background and Rationale of the ACC Dar Project

The “Adapting to climate change in coastal Dar es Salaam” (ACC Dar) Project is being implemented by The Inter-university Research Centre for Sustainable Development (CIRPS) at Sapienza University of Rome in partnership with the Ardhi University, Dar es Salaam, Tanzania. Building on previous collaboration between these two universities, the project aims to contribute to the implementation of the National Adaptation Programme of Action (NAPA) of the United Republic of Tanzania.

Expected results include:

- Enhanced capacities of Dar’s municipalities (especially Kinondoni) in understanding climate change issues, designing adaptation activities and integrating them in their strategies and plans for Urban Development and Environment Management;
- Enhanced development of methodologies for supporting the inhabitants of Dar’s coastal unplanned and under-serviced neighbourhoods in their efforts to adapt to climate change;
- Better understanding of actual and practical ways of addressing adaptation to climate change in coastal areas of fast growing African cities.

1.2 Objective and Purpose of the Study

The main objective of this study was to gather information and data on activities carried out in Dar es Salaam city for the purpose of preventing, coping with or recovering from climate effects with a focus on the knowledge in the custody of city and municipal council officials. The ultimate outputs intended to be derived from this study constitute information on:

- Current ways of addressing climate change issues at Dar es Salaam City Council and municipal levels; and
- Strengths, weaknesses, gaps and possibilities for improvement of existing climate change coping methods.

1.3 Study Methodology

From the methodological perspective, this study was carried out at two main administrative different levels. The first was the City council level, which addressed the issues of interest with a focus on municipal council. The second level was the municipal one whereby the issues of interest were separately addressed for each of the three municipalities of Dar es Salaam City.

The study was carried out primarily through a questionnaire survey (see Annex 4) augmented by follow up interviews with selected respondents. In addition to conducting a questionnaire survey, focus group discussions were also planned to be conducted. However, it was difficult to organise focus group discussions because gathering the required number of officials proved to be a challenge as most of them were busy with out-of-office work for most of the time.

The questionnaires were administered to staff of the Dar es Salaam City Council, Ilala Municipal Council, Kinondoni Municipal Council, and Temeke Municipal Council.

Questionnaire survey was conducted in all departments which are responsible for dealing with issues pertinent to climate change and the environment.

Heads of departments and other randomly selected officials from the following departments were interviewed at Dar es Salaam City Council:

- a) Urban Planning, Environment and Transportation
- b) Waste Management
- c) Works and Fire Rescue

In the municipal councils, officials from the following departments were interviewed:

- a) Waste Management,
- b) Works and Water Department
- c) Lands and Urban Planning
- d) Natural Resources and Tourism
- e) Agriculture and Livestock Development
- f) Community Development

Most of the questionnaire forms were administered face-to-face. For the officials who had no time for face-to-face interview, the questionnaire forms were left to them for filling and they were collected later. A total of 47 questionnaires were administered. The intention was to interview all heads of units plus any other 3 members of staff to be selected randomly from each department.

In the case of Temeke Municipality Council, the study had a target of interviewing 16 members of staff. Out of 16 questionnaires delivered only 14 questionnaires were satisfactorily completed and successfully collected for analysis. This is a response success rate of 87.5%, which is fairly satisfactory. Overall, the response was relatively lower for the department heads than for their subordinates.

It can be argued that the heads of department simply did not have the time to fill the lengthy questionnaire because of their comparatively busier work schedules.

1.4 Scope and Organisation of the Report

As observed earlier, this study focused on Dar es Salaam City and its three municipalities of Ilala, Kinondoni, and Temeke. Therefore, the spatial scope of this study is limited to the three municipalities. The study was carried out mainly in the third and fourth quarters of 2011 and as such, this period specifies the temporal scope of the study. The target sources of data for this study were city and municipal council officials of services, departments, and sections already involved in climate change issues. Examples of these are those responsible for urban planning, waste management and sanitation, and natural resources.

The information presented in this report is organised on the basis of two hierarchical levels, that is, city and municipal levels. However, the presentation of the main body of the report is organised into four parts. Chapter 2 focuses on Dar es Salaam city council while Chapter 3, Chapter 4, and Chapter 5 address issues pertinent to Ilala, Kinondoni and Temeke municipalities, respectively.

2 Dar es Salaam City



2.1 Introduction

Dar es Salaam the Harbour (heaven) of Peace in Arabic, the name having come from the Persian-Arabic Bandar-ul-Salaam (Bandari ya Salama in Swahili) with the total surface area of 1,800 square kilometers, comprising of 1,393 square kilometers of land mass with eight offshore islands, which is about 0.19% of the entire Tanzania Mainland's area was declared a Township in 1920 and in 1949 it was upgraded to a Municipality under the first appointed British Mayor Mr. Percy Everett; Dar-es-Salaam Municipality was elevated to a City status after Tanganyika got its independence in 1961 (Dar City Council, 2004).

According to Dar City Council, 2004 report, in 1996 the DCC was dissolved and the Dar-es-Salaam City Commission appointed with two major tasks; to perform the day-to-day functions of an urban local authority, and to propose the restructuring of administration of the Dar-es-Salaam City. The Commission ceased in 2000 and the new Administrative Structure was put in place. It later on became one city with four local councils (Temeke, Ilala, Kinondoni and the City council) (Faldi, 2011).

2.2 Dar es Salaam City Physical and Social-Economic Characteristics

Location

Dar es Salaam is located at Longitudes 37010" to 39030" E and Latitudes 06015" to 07040"S (Faldi, G., 2011) while bounded by the Indian Ocean on the east and by the Coast Region on the other sides (Dar City Council, 2004).

Climatic Condition

The City experiences a modified type of equatorial climate. It is generally hot and humid throughout the year with an average temperature of 29°C. The hottest season is from October to March during which temperatures can raise up to 35°C. It is relatively cool between May and August, with temperature around 25°C. There are two main rain seasons; a short rain season from October to December and a long rain season between March and May. The average rainfall is 1000mm (lowest 800mm and highest 1300mm). Humidity is around 96% in the mornings and 67% in the afternoons. The climate is also influenced by the southwesterly monsoon winds from April to October and northwesterly monsoon winds between November and March (Dar City Council, 2004).

Population

The city's population grew from only about 3,500 in 1867 to 128,742 in 1957, to 272,821 in 1967 to 843,000 in 1978 and 1,360,850 in 1988 census recorded while based on the 2002 Population and Housing Census, Dar es Salaam had 2,487,288 inhabitants; up to 2004 the population was estimated to be 2.5 million with a growth rate of 4.3% (Dar City Council, 2004). Currently the city's population is estimated to be 3.5 million people with current growth rate of 5%.

Economic Activities

According to Dar City Council, 2004 report, DCC and its Municipalities is having a community with sustainable social and economic development through participatory resource mobilization and utilization thus enhancing the quality of social and economic services by using the existing resources and opportunities.

The major economic activities in Dar es Salaam include; Internal Trade, Manufacturing, Tourism, Transport and Communication, Urban Agriculture, Forestry and Fishing, Mining and Quarry, Utility Services, Construction, Finance and Insurance, Public Administration and Education.

Administrative Structure

According to Mwakyusa the Head of the Urban Planning, Environment and Transportation; the city council is headed by the Mayor of the city and the city director where by the City director is responsible for all activities and reports to the City Mayor. The city also has five departments including the Administration, human resources and finance department, Urban planning, environment and Transportation department, Works and fire rescue department, Waste management department and Health department which are all headed by the heads of departments who report to the City director.

Urban Planning and Environment

The Dar es Salaam City Council, through Sustainable Dar es Salaam Project (SDP) introduced a new urban planning and management approach through the application of the Environmental Planning and Management (EPM) process (Dar City Council, 2004). The EPM is a process-oriented framework, which permits the different stakeholders to discuss their problems, negotiate strategies and seek solutions collectively to priority issues of common concern. It is therefore, a strategic approach to urban environmental planning and management based on enabling participation and building commitment.

In the environmental issues, The Local Government (Urban Authority) Act 1982 (Section 55 grams) imposes on urban authorities the mandate "to remove refuse and filth from any public or private place" and to provide and maintain public refuse containers for the temporary deposit and collection of waste (Dar City Council, 2004).

Municipal Councils (Ilala, Temeke, Kinondoni) of the Dar es Salaam city in particular play an important role in the financing, planning and providing waste collection and disposal services. Waste management services are placed under Waste Management Department, but other departments such as Works, Health, and Urban Planning are also involved in one way or another. The wastes are from residential, industrial areas and commercial establishments like markets and other informal sectors (Dar City Council, 2004).

Education System

According to Dar City Council, (2004) report, the education system is divided into stages, starting from pre-primary education to the tertiary education. The primary education is of seven years where children aged seven years are enrolled, over aged children are involved in the Complimentary Basic Education in Tanzania (COBET). On the other hand ordinary secondary education is of four years while advanced secondary take two years. However after secondary educations the pupils who pass their examination are tenable to join colleges for certificates, diploma, advanced diploma and degrees.

Crime and Violence

Safety and Security, are a major concern for Dar es Salaam City residents, a cross cutting priority in development planning and service delivery functions of the City Council and the three Municipals Authorities of Dar es Salaam /City Region. It's also a statutory function per the Country's Constitution and Local Government Laws (Dar City Council, 2004).

Health Situation

The status of health services in Dar es Salaam is very poor with ratio of population to physician of 18,637 (18,637 persons are under the care of one physician) by 2004. The Nation Health Insurance Fund (NHIF) is a compulsory health insurance scheme established by the Act of Parliament No. 8 of 1999 to provide health care services of public servants and their dependants.

By 2004 the NHIF medical care services covered over 242,508 for public servants and over 1.2 million beneficiaries through a net work of over 3,500 accredited public/ private health facilities.

However the majority of NHIF members are within an average of 10km from these facilities which affect the service to the members within the vicinity (Dar City Council, 2004).

Fire Services

According to Dar City Council, 2004 report, Fire and Rescue is one of the services which the City Council is obliged to render in accordance with section 69A of Local Government Act No. 6 of 1999. Together with the services offered by the DCC, other fire service providers in the City of Dar es Salaam are: Tanzania Harbours, Tanzania Airports Authority and Knight Support.

The service is free of charge from the DCC using its Fire Brigade while on the other hand, private sector providers such as Knight Frank charge a fee for their service. The high rate of urbanization taking place in Dar es Salaam has lead to the Fire and Rescue services failing to cope with the increasing demand (Dar City Council, 2004).

2.3 Survey Findings

2.3.1 Names and Details of the Interviews

Questionnaire survey was conducted in three departments of the DCC where two members of staff from the Department of Planning, Environment and Transportation, three including the HOD from Waste Management Department, and two including the HOD from Works and Fire Department were interviewed. The names and details of the interviewees are shown in Table 2.1.

Table 2.1: Names and Details of Interviews

Department	Name of Interviewee and Section	Details
Urban Planning, Environment and Transportation	Mrs. Martha Mkupasi; Coordinator Safer Cities	Female aged 44, MSc UPM holder. 0713 300208, mjmkupasi@yahoo.com
	Grace B. Mbena Town planner Officer and Ag. EPM coordinator	Female aged 31, BSc. URP holder 0713 757501/ 0783 757501
Waste Management	Mr. Membe P. Membe Ag. HOD	Male aged 56, Adv. Dip. Health and Vector Control membemasasi@yahoo.com
	Mr. Samwel Buberwa Ilala Municipal Waste Manager	Male aged 48, PGD Urban Waste Management 0754 363627, sbuberwa@yahoo.com
	Mr. Richard K. Matari Environmental Health Officer	Male aged 30, Dip. Environmental Health 0713 24 16 15
Works and Fire Rescue	Engineer Nati HOD	Male aged 49, MSc. Holder
	Mr. Fikiri S. Salla Chief Fire Officer	Male aged 49, Adv. Course on Fire Safety Mgmt 0713 409568, fsalla@hotmail.com

2.3.2 Age Distribution

Age of the interviewees ranged from 21 to 59 years. Proportions of respondents in various age brackets are shown in Figure 2.1. It is apparent from Figure 2.1 that most of the respondents were between 41 and 50 years old. This observation suggests that most of the interviewees were old enough to comprehend various issues pertinent to climate change.

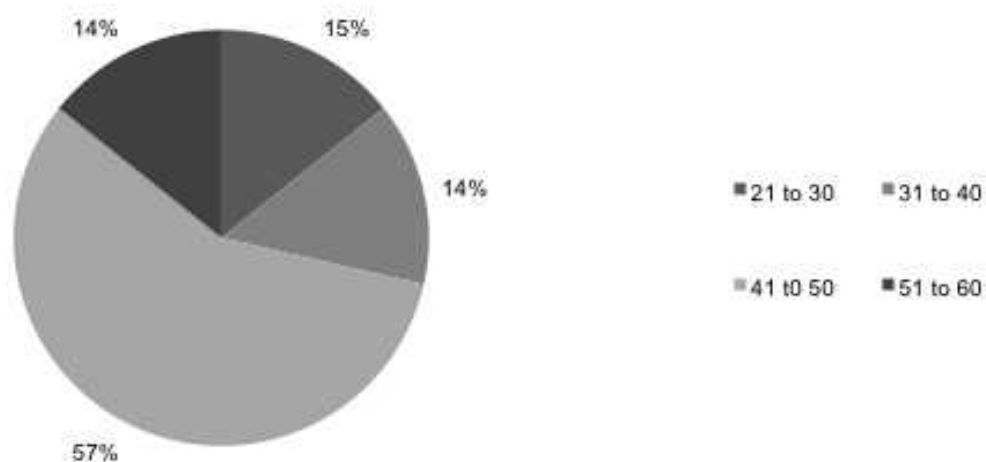


Figure 2.1: Interviewees Age Distribution

2.3.3 Education Profile

Education levels for the interviewees ranged from certificates to Masters Degree; 14.3% have certificates, ordinary diploma, advanced diploma, postgraduate diploma and first degree while 28.5% had Masters Degree in various fields as Annex A1 shows. Most of the respondents are educated in urban planning, health and environment related disciplines and as such it can be assumed that they were conversant with the subject matter of the research for which the interviews were conducted.

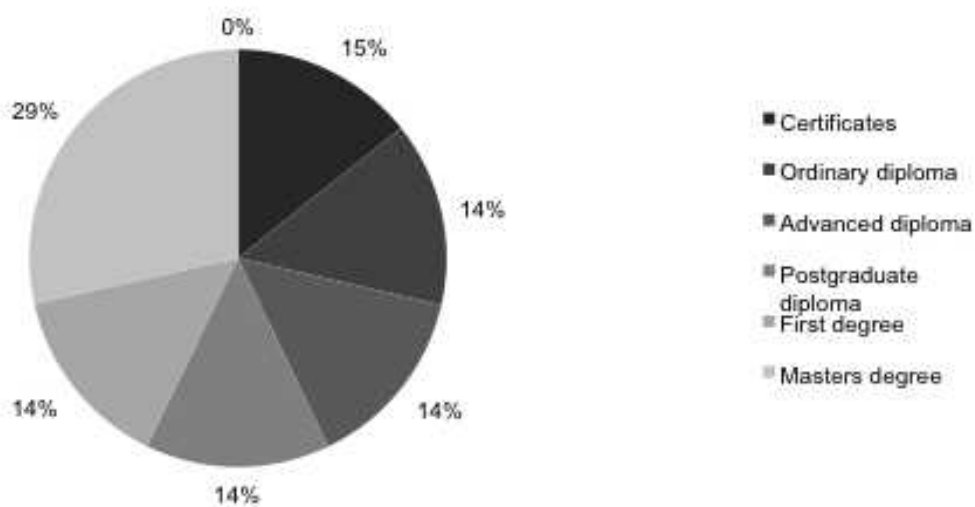


Figure 2.2: Education Profile for Interviewees

2.3.4 Period of Service

The interviewees have served the DCC for different durations ranging from 1 to 30 years. Most of the interviewees (43%) have served the DCC for a period of 1 to 5 years (Figure 2.3).

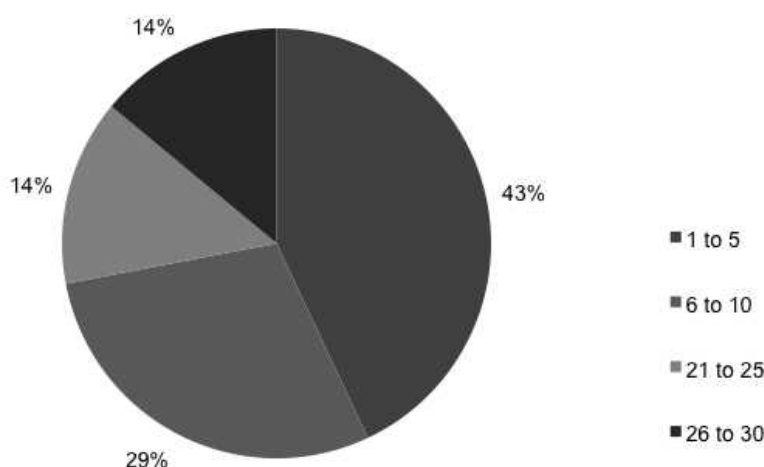


Figure 2.3: Distribution of the Years of Services for the Interviewees

2.3.5 Competence and Responsibilities

The respondents have different competences and responsibilities in their departments and sections within the DCC as shown in Table 2.2.

Table 2.2: Competence and Responsibilities of Staffs in Different Departments

Department	Competence and Responsibilities
Urban Planning, Environment and Transportation	<p>The coordinator of Safer Cities is responsible for overseeing the development of sustainable crime prevention strategies based on local partnership approach. This is achieved through identification of crime groups and creating awareness on the impacts of crimes. The object is to partner them and build their capacity to generate income through involvement in various community activities (e.g. a group in Kitunda is currently engaged in livestock keeping and participatory security locally known as sungusungu).</p> <p>The town planning officer is responsible for land and developmental planning and acts as Environmental Planning and Management (EPM) coordinator.</p>
Waste Management	<p>The Head of Department coordinates all departmental activities including supervision of operation and maintenance of the Pugu dump site and coordinating the three municipal councils (Ilala, Kinondoni and Temeke) in management of waste.</p> <p>The Environmental Health Officer deals with solid waste dumpsite management.</p>
Works and Fire and Rescue	<p>The Head of Department coordinates all activities in the department including approval of building designs and other engineering activities.</p> <p>The Chief Fire Officer is responsible for issues pertinent to all fire and rescue in the City. Fire and rescue services are centralized. In view of this, municipal councils do not offer fire and rescue services.</p>

2.3.6 Relationship between Institutions

The DCC coordinates activities, promotes cooperation between the City Council and amongst local government authorities within the City. DCC also deals with all matters for which there is inter-dependency among the Municipalities (i.e. Kinondoni, Ilala and Temeke) as well as it provides peace, security and emergency services including fire fighting and rescue operation. It stands as a link between them, in that case most of the activities in sub wards are supervised by the municipalities, and the DCC links the three municipalities for interdependent issues.

The Local Government Act 1982 gives power to the city for coordination of the activities among the municipalities but it is silent pertinent to accountability of the municipal councils to the city council. This has to some extent has caused difficulties in the delivery of services and implementation of development projects since in most cases the municipalities work independently without consulting the City Council.

Table 2.3: Relationship between Departments of DCC with the Municipalities

Department	Relationship with the Municipalities
Urban Planning, Environment and Transportation	In urban planning and environmental issues, the city and the municipalities work together implying that if there are some programs undertaken by the City Council and needs to be implemented in PU areas then DCC has to liaise with the municipalities prior to implementing the projects in the respective wards.
Waste Management	In waste management, the City Council is mainly responsible for solid waste disposal including development and management of dumpsites (Mtoni and Pugu dumpsites). Collection and transportation are handled by the respective municipalities as stipulated in the Local Government (Urban Authority) Act 1982 (Section 55 grams). However, planning of various activities concerning waste management is done jointly by the municipalities and the City Council.
Works and Fire and Rescue	The Engineering Section of the Department works with the municipalities especially in approving drawings of buildings and other infrastructures as part of the process of issuing permits for construction. The fire and rescue services are centralized and as such these services are not available at municipal council level.

2.3.7 Strategies and Programs in PU

The DCC has various programs, projects and strategies which are being implemented by its departments including the Safer City Program, Land Use Planning Strategy, Public Participation Strategy and Integration of Primary Waste Collection and Secondary Waste Collection Strategy. Other programs, projects and strategies include Funds for Research and Development purposes and Establishment of Transfer Stations (Ts) and Material Recovery Facilities (MRF) Strategy, and Strategy for Establishment of Seven More Fire Stations as described in Table 2.4.

Table 2.4: Existing Programs, Projects and Strategies

Program/Strategy	Description
Safer City Programme	One of the main objectives of this program is to address the underlying causes of crime (e.g. in Kurasini through women safety audit some bushes were cleared in open spaces and near cemetery to remove hiding places for the criminal groups); Groups involved in criminal activities were identified and educated on the impacts of their activities. Through this program, criminal groups in Kitunda Ward were engaged in conducting various lawful income generating activities and community services e.g. participatory security, livestock keeping and waste management.
Land use planning strategy	The City Council in collaboration with the municipal councils is striving to ensure that the PU areas are properly planned and developed in a sustainable manner.
Public participation strategy	One of the main goal of this strategy is to facilitate efficient waste collection and management at generation points.
Integration of primary waste collection and secondary waste collection strategy	Integration of primary collection (generally done by CBOs) and secondary collection (conducted by the municipalities) and formalization of informal CBOs so that they can be integrated into the waste management system at municipal level for enhancement of waste collection efficiency.
Fund for research and development purposes and establishment of transfer stations (TS) and material recovery facilities (MRF) strategy.	This strategy aims at raising funds for conducting research on establishment of TS and MRF
Strategy for establishment of seven more fire stations	The strategy seeks to establish seven more fire stations in the PU including Tegeta, Mbezi Luisi, Mbagala, Kigamboni, Tabata, Mwenge and Gongo la Mboto which would reduce the distance travelled by fire tenders during fire outbreak in the PU most of which are located far away from the Central Fire Station.

2.3.8 Specific Policies and Strategies for PU

The city council has no specific policies and strategies for PU. However, most of the strategies and policies such as Waste Management Strategy (2010), Improvement of Infrastructures in Unplanned and Unserved Areas and Fire Protection are designed to cater for the whole city including the PU areas.

2.3.9 Financial Resources

Generally, the financial resources for implementation of various activities and projects come from the City Council itself, central government, public contributions and development partners, international organizations such as UN-Habitat, SIDA and CIDA and Hamburg State Government.

Table 2.5: Sources of Funds for the DCC

Department	Sources of Finance
Urban Planning, Environment and Transportation	Safer City Program is funded by UN-Habitat, SIDA, CIDA, DCC and Central Government
Waste Management	Hamburg State Government, DCC, Public contribution, Central Government and Republic of Korea
Works and Fire and Rescue	Hamburg State Government, citizens, DCC and Central Government

2.3.10 Facility Supply in the PU

All the respondents stated that the facility supply systems in the PU are not satisfactory (Figure 2.4) and that they strongly depend on each other i.e. one system seems to affect the efficiency of the other systems. Most of the PU areas are not formally planned and transport service is not satisfactory especially for areas located far away from the main roads. Inadequate transport system reduces the efficiency of solid waste management and fire and rescue services. On the other hand, lack of planning reduces accessibility of the PU areas for waste collection and fire and rescue services. Some areas are yet to be provided with electricity while most of the areas in PU depend on boreholes since the City piped water supply system is erratic. Access to health centers is a problem due to long travel distances and inadequate human resources, medical equipment and medicine. However, some of these services have been noted to improve with time especially education, health and waste management.

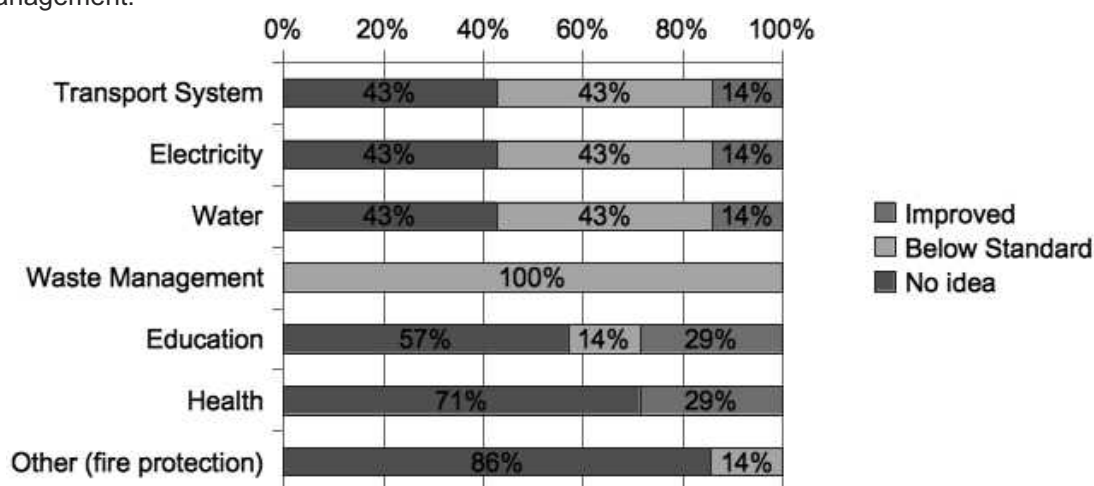


Figure 2.4: Facility Supply in the Peri-urban Areas

2.3.11 Development Changes in the PU in Past Years

All the respondents revealed that there are developmental changes, which have taken place in the PU especially in the construction industry (improved and modern houses have been built replacing thatched and mud/pole houses). Some of these houses have rain water harvesting systems. Business opportunities have also increased as attested by an increase in the number of businesses (grocery shops, hardware and horticulture).

2.3.12 Main Linkage and Interdependencies between City Centre, PU and Rural Areas

Due to the availability of ample space, PU has become a dwelling place of choice for some people who used to live in fully built-up areas. Due to this, movement of people from PU to the city centre for seeking business and job opportunities has increased. Movement of food products was reported to be in both directions. It was also mentioned that most of the criminal groups reside in the PU areas. They normally go to the city centre to commit crimes and return to their hiding places in the PU areas. Moreover, respondents stated that PU areas act as a link between the rural and city centre since food products are transported to the city centre with facilitation of business persons residing in the PU areas who also facilitate the flow of goods from the city centre to the rural areas.

2.3.13 Informal and Formal Groups, NGOs, CBOs and SACCOS Operating in the PU

Table 2.6: Activities of Various Groups and Organizations and their Interactions with DCC

Group of people/Organization	Activities	Interaction with DC
Sokoine Youth Development Group in Kigamboni (SYD)	Agriculture	DCC provides training and financial grants The group is not involved in decision making
Mradi wa Maendeleo na Sungu-sungu Kitunda (MMK) (Project on Development and Community Policing)	Agriculture, livestock keeping and security services	DCC provides training and financial grants The group is not involved in decision making
Gongo la Mboto Youth	Waste management	DCC provides training and financial grants The group is not involved in decision making
Kombo Youth	Waste management	DCC provides training and financial grants The group is not involved in decision making
Pugu Kinyamwezi	Waste management	DCC provides training and financial grants The group is not involved in decision making
Dogodogo centre in Bunju	Fire protection activities; a fire station has been established and there is one fire tender. The fire station was established in cooperation with Hamburg City in Germany	DCC provides training and financial grants The group is not involved in decision making

2.3.14 Changes in Environmental Conditions in the Past Years

Figure 2.5 shows the responses on changes in environmental conditions as observed by the interviewees. It is apparent from Figure 2.5 that most of the respondents (71.4%) observed changes in the rainfall pattern, which may be attributed to climate variability. Water availability is related to changes in rainfall pattern and as such it is not surprising that 42.9% have reported the water scarcity problem. According to the respondents, water scarcity is attributed to an increase in population, high humidity, changes in rainfall pattern and amount, which has been observed to decrease.

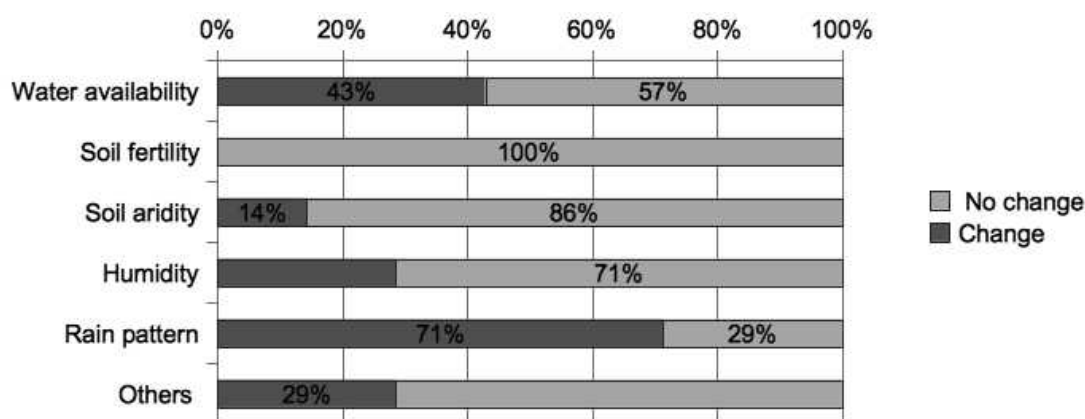


Figure 2.5: Percentage Responses on Environmental Changes

2.3.15 Evaluation of Environmental Changes in the PU

So far, no formal evaluation has been done on the environmental changes, which are occurring in the PU areas. However, most of the reported changes in environmental conditions are based on physical observations and personal opinions.

2.3.16 Implementation of Strategies to cope with the Environmental Changes in the PU

Table 2.7: Strategies to Cope with Environmental Changes

Department	Strategy to cope with Environmental Changes
Urban Planning, Environment and Transportation	The City Master Plan was prepared for ensuring that the city is developed in a regulated and controlled manner. A strategic urban and development planning framework of 1999 identified various areas for exploitation of construction materials. However in 2004, some areas, which were used for sand extraction (e.g. Kitunda) were closed and sand quarrying activities were transferred to Buyuni area. Although Kunduchi stone quarry was closed, quarrying activities are still going on.
Waste Management	A project on collection and flaring of methane gas at Mtoni dump site is being implemented as one of the means of reducing emissions of greenhouse gases. The project was as implemented for minimizing the effects of gaseous pollutants to people living in the surrounding areas. This project is jointly implemented by DCC and an Italian company called Consozio Stabile Globus (CSG).
Works and Fire and Rescue	Strategies for improvement of infrastructure in PU areas have been put in place. On the other hand, use of environmental friendly fire fighting equipments and chemicals is encouraged as one of the means of protecting the environment in Dar es Salaam (ozone depleting chemicals like Bromochloro Difluoromethane and Bromofluoromethane were banned in 2010)

2.3.17 Autonomous Adaptation Actions to the Changes

In the PU areas where some changes in environmental conditions have been observed autonomous adaptations actions have been reported by the respondents. About 29% of the interviewees observed changes in the types of crop cultivated (e.g. from maize to cassava) with an increasing tendency of cultivating drought resistant crops (notably cassava) and opting for horticulture. Close to 14% of respondents observed changes in the quality of houses constructed from traditional (thatched with mud/pole walls) to modern houses (corrugated iron sheet and block walls) some with rainwater harvesting systems. Fourteen percent (14%) of the interviewees observed changes in the livestock grazing system from free to zero grazing while others observed that people have switched from cattle keeping to poultry keeping due to lack of pastures as a result of drought (Figure 2.6). On the other hand, 29% of respondents observed changes in the crop system used, livestock raising system and quality of house constructed. About 14% did not observe any adaptation measures pertinent to changing environmental conditions in the PU areas. In some PU areas, residents have organized themselves in management of waste and have also put restrictions on stone and sand quarrying activities for controlling soil erosion and preserving the integrity of the natural landscape.

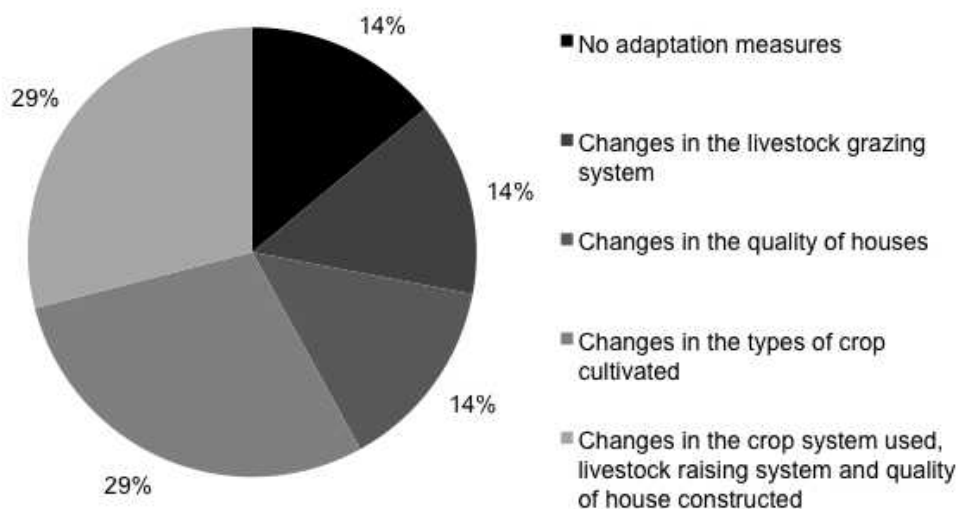


Figure 2.6: Observed Autonomous Adaptation Options

2.3.18 Information or Baseline Study on PU Environment, Dwellers and Livelihood

Available baseline information reported by 42.9% of the interviewees is limited to solid waste generation rates and values of properties, which have been determined for the purpose of tax and revenue collection. The rest of the respondents (57.1%) had no information on baseline studies, which have been conducted in the PU areas.

2.3.19 Reasons for Environmental Changes

Environmental changes observed by 14% of the interviewees (Figure 2.7) were associated with changes in land use from natural vegetation to residential and commercial, overpopulation, unplanned and uncontrolled construction activities, irrational extraction of construction materials, which has been responsible for soil erosion and impairment of scenic beauty.

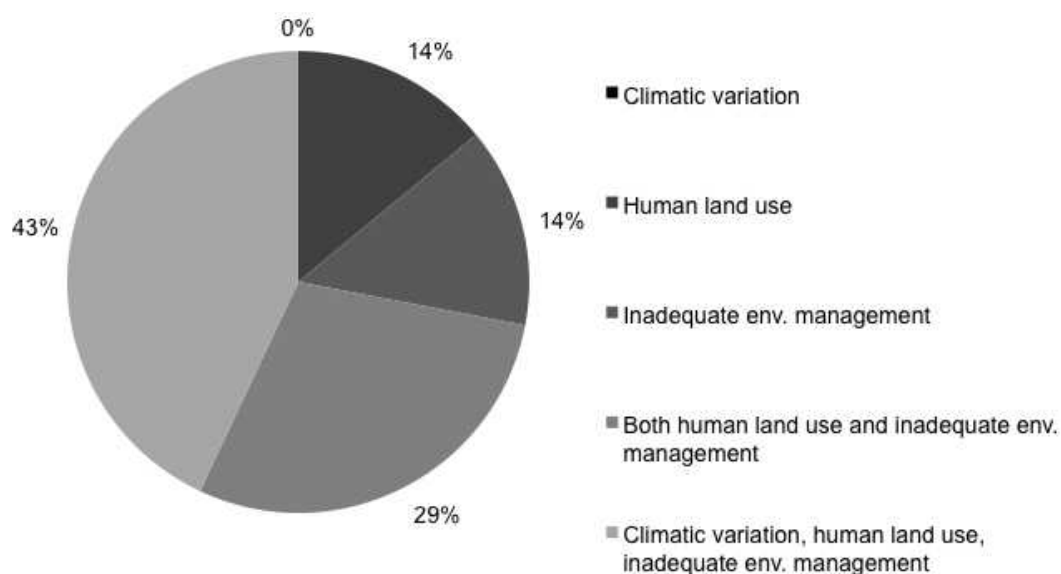


Figure 2.7: Reasons for Environmental Changes

Fourteen percent (14%) reported that poor sanitation, high road traffic volume and inadequate waste management services have increased pollution loads to the environment. On the other hand, approval of inadequate and biased Environmental and Social Impact Assessment was mentioned as a one of the factors, which have caused environmental changes. For this reason respondents reported that projects, which are not environmentally sound have been approved for implementation in the PU areas. Inadequate awareness among individuals on environmental protection and management issues has also been cited by 14% of respondents as one of the reasons for unfavourable environmental changes in the PU areas. About 29% of respondents attributed changes in environmental conditions to both uncontrolled changes in the land use and inadequate environmental management. A combination of climate variability, irrational changes in the land use and inadequate environmental management was mentioned by 43% of respondents to be responsible for the observed changes in environmental condition.

2.4 Conclusion and Recommendations

The DCC coordinates all the administrative, planning and developmental activities that require the participation of the three municipal councils (Ilala, Kinondoni and Temeke).

Various projects, strategies, policies and programs including the Safer City Programme, Strategy for establishment of seven more fire stations and Public Participation in Waste Management are being implemented at the moment for addressing various social, economic and environmental challenges the City is facing. However, there are no specific projects, strategies and programs for addressing specific challenges, which are encountered by residents of the PU areas.

The PU areas were also observed to be lacking basic social and physical infrastructural services. Although PU areas are becoming domicile of choice for some residents who wants to have ample space for their economic activities, development in these areas is uncontrolled and unregulated. It was also observed that the City Center, PU areas and rural areas have a strong link and inter-dependences especially in relation to flow of consumer goods and agricultural products.

Most of the interviewees had the opinion that the observed changes in environmental conditions in PU areas are caused by a combination of factors which are climate variability, irrational changes in the land use and inadequate environmental management. However, their observations could not be scientifically substantiated due to lack of published studies on socio-economic and environmental dynamics of PU areas.

3 Ilala Municipality



3.1 Introduction

Ilala District is centered within three districts in Dar es Salaam, Tanzania, with Kinondoni located to the far North of the city, and Temeke being located in the south of Dar es Salaam. To the East is the Indian Ocean and to the South and West is the Coast Region (Figure 3.1).

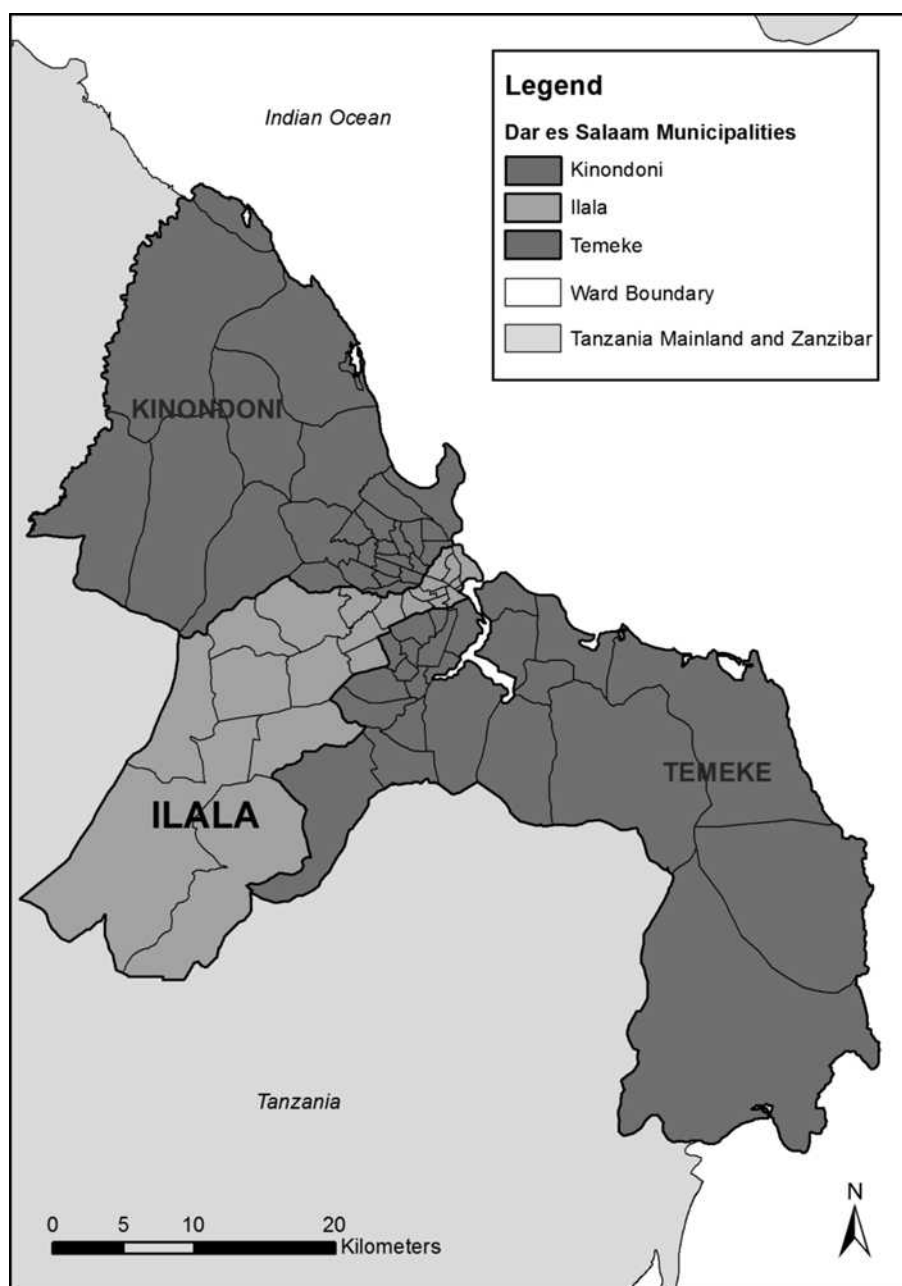


Figure 3.1: Dar es Salaam City Administrative Boundaries

3.2 Ilala Municipality Physical and Social - Economic Characteristics

Ilala is actually an administrative district within Dar es Salaam, and consists of twenty two wards namely Buguruni, Chanika, Gerezani, Ilala, Jangwani, Kariakoo, Kinyerezi, Kipawa, Kitunda, Kisutu, Kivukoni, Kiwalani, Mchafukoge, Mchikichini, Msongola, Pugu, Segerea, Tabata, Ukonga, Upanga East, Upanga West and Vingunguti. The Municipal Council areas are dominated by Commercial centres including the city centre, residential areas, manufacturing industries (heavy and light industries). Government buildings and most of the National administrative offices and offices of international organisations are located in Ilala municipality.

According to (2002 census) the population of Ilala municipality was 634,924 people and the projected population based on the growth rate of 4.6 percent is estimated to be about 800,000 people in year 2011 where by majority of residents are aged between 20 and 24 years.

3.3 Findings of Questionnaire Survey

3.3.1 Respondents' Working Experience, Gender Distribution and Age

The interviewed municipal council officials had working experience ranging from 2.5 to 11 years, and at least 54% of the officials have been working for Ilala Municipal Council for more than 5 years which signifies that they have reasonable understanding of the issues related to their responsibilities as well as geographical areas of their jurisdiction. To understand the causes and effects of climate change, education is one of the important factors. The respondents have education levels ranging from Secondary education to Masters Degrees in various disciplines suggesting that they may be able to comprehend some basic issues pertinent to climate change.

Gender wise, males dominated the number of municipal council officials interviewed, whereby men accounted for 76.9% of the respondents whereas the rest were females (Figure 3.2). The age of respondents ranged from 37 years to 52 years.

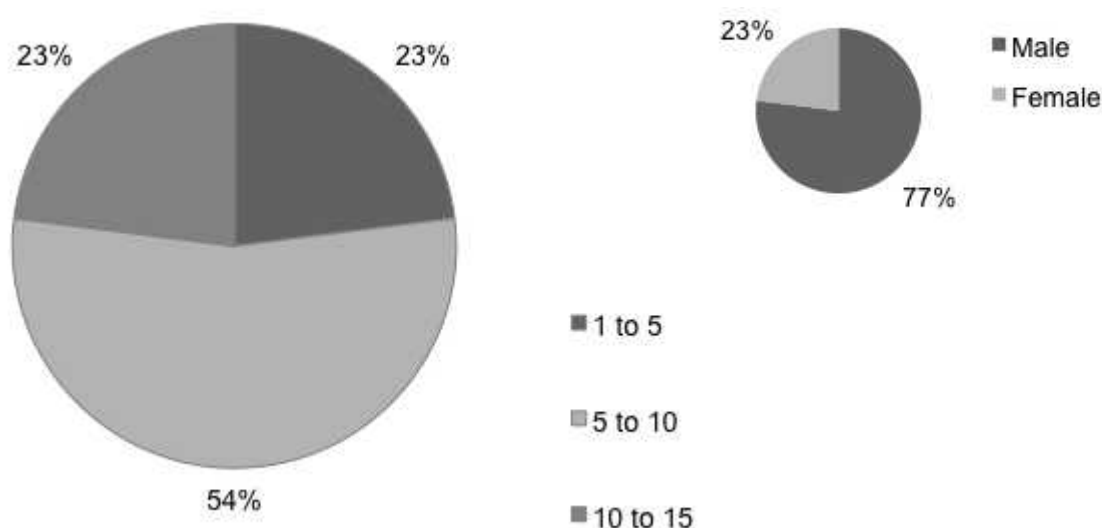


Figure 3.2: Gender and Working Experience of Respondent

3.3.2 Personnel Competence and Responsibilities

All the interviewed officials in Ilala Municipal council (IMC) are involved in delivery of services pertaining to water supply, natural resource management, land surveying, social work, storm water management, waste management, land use planning, environmental management, environmental health and agriculture and livestock keeping.

3.3.3 Main Relationship between Ilala Municipal Council and other Institutions

Ilala Municipal Council departments at higher level relate with relevant ministries of the central government which have the responsibility of preparation of plans and formulation of policies, which the municipal council is supposed to implement. Each department has its responsible ministry, which it closely works with. For example, the Department of Lands and Urban Planning has a close working relationship with the Ministry of Lands, Housing and Human Settlements Developments, whereas the Department of Works and Water interacts closely with the Ministry of Works and Ministry of Water.

Activities of the Departments are focused in the following aspects

- To act as a link in policy implementation between the Central Government and local Government
- As experts, municipal officials are responsible for implementing plans, policies and directives from higher administrative levels (relevant ministries and the Dar es Salaam City Council). They are also required to give a professional interpretation of plans, policies and directives for disseminating them to institutions under their areas of jurisdiction (wards, sub-wards and villages)
- Analyzing and identification of problems encountered in the municipality including peri-urban areas and providing remedial measures where possible
- Establishing of a standardized approach for the collection and analysis of various problems in wards, sub-wards and villages and collaborating with leadership at these levels in solving the problems
- Reporting of development activities and public campaigns taking place at ward, sub-ward and village levels
- Issuing or endorsing and forwarding to the relevant authorities applications for permits and licenses for undertakings socio-economic activities and development in the respective areas of their jurisdiction

Some municipal departments such as Environment, Health, Water and Lands have representations at lower levels of the municipal administration such as ward and street (mtaa). For example, the ward environmental committees and water committees which are answerable to the ward officer have a responsibility of supporting the municipal departments in implementation of plans, policies and directives.

3.3.4 Strategies, Programs and Plans Implemented in Peri-Urban Areas

Some programmes and projects, which are implemented in PU areas were identified by respondents including environmental conservation projects around Kazimzumbwe forest reserve, establishment of zoo and botanical garden. The environmental conservation project in vicinity of Kazimzumbwe forest reserve project aims at conservation of water sources located within the forest. The project on establishment of Chanika zoo is meant for conserving ecological integrity of the area for ensuring that anthropogenic activities which are not environmental friendly are prohibited. The City Botanical Garden at Pugu Kinyamwezi was established for preservation of plant species of ecological importance. A project on establishment of the greenbelt Kinyerezi area is implemented for the purpose of protecting water sources against destruction and drying up. The water supply and sanitation project is implemented to alleviate the water shortage problem and improve the public health.

3.3.5 Specific Policies and Strategies for PU Areas

Some of the respondents could not identify policies that are specifically designed for implementation in PU areas. However, an official from the Department of Agriculture reported that training on preservation of soil productivity is conducted every year in PU areas. Waste Management Department is planning to establish a new sanitary landfill at Pugu Kinyamwezi with a capacity of accommodating all the waste generated in the city. The Department of Lands and Urban Planning is in the process of preparing physical plans, which will specify areas to be used for commercial, institutional, recreational and residential purposes in PU areas including Kinyerezi, Chanika and Pugu wards

3.3.6 Sources of Funds for Implementing Projects

Internal sources of funds for implementing of development programmes and projects for the Municipal Council are taxes, revenues and fees. Other sources of funds stated by interviewees are the Central Government, multinational financial institutions and development partners such as the World Bank, Belgium Technical Cooperation (BTC), JICA, and UN Agencies.

3.3.7 Opinions on Current Situation for Provision of Social Services in PU areas

Level of provision of social and physical infrastructures in PU areas including transport, electricity, water, waste management, education and health was investigated pertinent to the level of adequacy or satisfaction. Three levels were selected to gauge the level of provision of social and physical infrastructure services i.e. Poor, Inadequate or Satisfactory. Table 3.1 shows the opinion of the interviewees on the level of provision of social and physical infrastructure services in Ilala Municipality.

Table 3.1: Opinion of Municipal Officials on the Level of Provision of Social and Physical Infrastructure Services in Ilala Municipality

Level of Satisfaction (%)			
Service	Poor	Inadequate	Satisfactory
Transport	77.0	23.0	0.0
Electricity	92.3	7.7	0.0
Water supply	61.5	38.5	0.0
Waste management	69.2	30.8	0.0
Education	53.8	46.2	0.0
Health	61.5	38.5	0.0

It is apparent from Table 3.1 that most of the respondents rated the level of provision of social and physical infrastructure services in Ilala Municipality to be poor. This observation is not surprising because PU areas are generally not given priority in allocation of funds for social and physical infrastructure development.

3.3.8 Changes in PU Areas in Last Years

Most of the respondents reported developmental changes in PU areas including fast establishment of settlements in areas which were predominantly rural in terms of activities, which were taking place but now are becoming urbanised. The rate of migration of people to the PU areas has been reported to be high. This factor has caused irrational exploitation of natural resources (such as sand, stone and wood based fuel) and increased the demand for social and physical infrastructure services, which are generally not adequate.

3.3.9 Interdependencies between PU Areas and City Centre

All the respondents stated that there is a strong interdependence between the PU and urban areas in various aspects. There is a tendency of people to prefer to live in PU areas and work in the city centre. There is also a flow of consumer goods and industrial building construction materials from urban to PU areas. Natural resources especially construction materials (such as sand, stone and aggregates) as well as forest products (notably timber, charcoal and firewood) are obtained from PU areas and sent to urban areas for use. Food stuff have been observed to flow in both directions depending on the type of food. Some of the food stuff consumed in PU areas originate from the urban areas particularly big markets at Kariakoo, Mabibo and Tandale. Cassava and vegetables were identified as the main food stuff to originate from the PU areas.

3.3.10 Informal and Formal Network Groups of People, Organization Relation of Trust and Mutual Support Operating in PU areas

Some informal and formal network groups including NGOs, CBOs and SACCOS which operate in PU areas were identified. Most of these groups are engaged in issues pertinent to environmental conservation, solid waste management, credit offering, sanitation, health and hygiene promotion. Network groups which were mentioned by some respondents and their main activities are shown in Table 3.2.

Table 3.2: Network Groups in PU Areas and their Main Activities

Network Group and Location	Main Activities
Sanitation and Water Action (SAWA) NGO	Improvement of water supply and sanitation through rehabilitation of wells, installation of solar pumps, construction of low cost sanitation facilities. The group is also training ward and street leaders on how to run the water supply and sanitation projects
PLAN international (NGO)	Implementation of water supply projects
Water AID (NGO)	Implementation of water supply projects
CARE international (NGO)	Implementation of water supply projects
KIKUNDI CHA USAFI KITUNDA (CBO)	Solid waste collection and disposal
GULUKA Kwalala Environmental group (CBO)	Environmental conservation
Msongora Environmental Group (CBO)	Environmental conservation

3.3.11 Changes in Environmental Conditions in the Past Years

Table 3.3: Changes in Environmental Conditions

Environmental Aspects	Comments from Respondents
Water availability	Most (92%) of the respondents reported that availability of surface water has decreased. Consequently, most of the residents depend on groundwater and rainwater.
Soil fertility	Most of the respondents were not aware about changes in this environmental aspect except for the interviewees from the Agriculture and Livestock Department who claimed that soil fertility has decreased
Soil aridity	It was reported by most of the interviewees that soil aridity has increased due to the following reasons: low soil cover largely caused by bush fire, high population density, excessive groundwater extraction and inadequate rainfall.
Humidity	Most of respondents could not comment on this aspect
Rainfall pattern	Rainfall pattern was reported to be unpredictable since it has become irregular in recent years. In recent years, rain seasons have been characterized by extended periods of dry spells.
Others	High deforestation rate due to anthropogenic activities especially extraction of construction materials, building construction, farming and livestock keeping.

3.3.12 Evaluation of Environmental Changes in PU Areas

All the respondents stated that they have not done formal evaluation on the reported environmental changes. However, they have perceived them through observations and personal judgment.

3.3.13 Institution Implementing some Strategies to cope with Environmental Changes and Reducing People Vulnerability to the Impacts of Environmental Changes

Some projects related to water supply and environmental conservation were mentioned to be implemented in PU areas under the auspicious of some NGOs and the World Bank. These projects involved drilling of deep wells for water supply, conducting of campaign on planting of trees, conservation of the forest areas and identification and mapping of water sources for facilitating their conservation. However, according to the interviewees, all these projects were not specifically implemented to enable residents in PU areas to cope with climate change impacts.

3.3.14 Observed Autonomous Action to the Change in Environmental Conditions

Some activities in PU areas have been changed to cope with the changing environmental conditions. The type of agriculture has changed from rain fed to irrigation. In other PU areas like Kitunda Ward, people have switched from crop production to livestock keeping (especially poultry keeping) due to water scarcity and unreliable rainfall. In some PU areas especially those around protected areas people have encroached into forest reserves (notably Pugu-Kazimzumbwi forest reserve) and wetlands due to scarcity of land for crop cultivation. The style of livestock keeping has also been changed from free grazing to zero grazing due largely to scarcity of pastures.

3.3.15 Availability of Information or Baseline Study on PU Environment, Dwellers and Livelihood

Most of the respondents have not been involved in conducting studies on physical environment and socio-economic profiles of PU areas. They also do not possess published reports specifically on socio-economic and environmental profiles of PU areas. The only information, which is available, is on demography. All the respondents reported that some information on PU areas may be obtained from the National Bureau of Statistics but they had never bothered to find them.

3.3.16 Reasons of Environmental Changes

Most of the officials interviewed insisted that the environmental changes, which have been observed, have been caused by climate variability, anthropogenic activities, which have culminated into changes in land use as well as inadequate environmental management. The respondents did not fully understand causes of climate variability. However, they reported to have experienced impacts resulting from climate variability especially drought and floods. Inadequate environmental management was frequently mentioned by interviewees as one of the significant factors in causing the depletion and destruction of natural resources including water sources.

3.4 Conclusion and Recommendations

All the respondents were not very familiar with issues pertaining to climate change and its impacts. Consequently, they could not link activities of their departments and how they can mitigate the impacts of climate change. As a result climate change issues have not been mainstreamed in the plans, strategies, programmes and daily activities of the departments of the municipal council. Unless awareness on issues pertaining to climate change impacts is raised among the officials of municipal council, mainstreaming of climate change issues will not be realized. Consequently, municipal officials will not be able to formulate plans, projects, strategies and programmes, which are responsive to climate change impacts for helping people to adapt and cope with them. Therefore, it is important to build the capacity of municipal officials in climate change issues so as to enable them formulate plans, strategies, programmes, which will empower the city dwellers to adapt and cope with the climate change impacts.

4 Kinondoni Municipality



4.1 Kinondoni Municipality Physical and Social - Economic Characteristics

4.1.1 Location and General Introduction

Kinondoni Municipality is bordered by the Indian Ocean to the North East, Ilala Municipal to the South, Bagamoyo District to the North, Kibaha District to the West and Kisarawe District to the South West (Figure 4.1). The municipality is well linked by roads and other communication networks to the rest of the city and other parts of the country. Major link roads are: - Morogoro Road, Bagamoyo Road, Kawawa Road, Mandela Road and, Sam Nujoma Road.

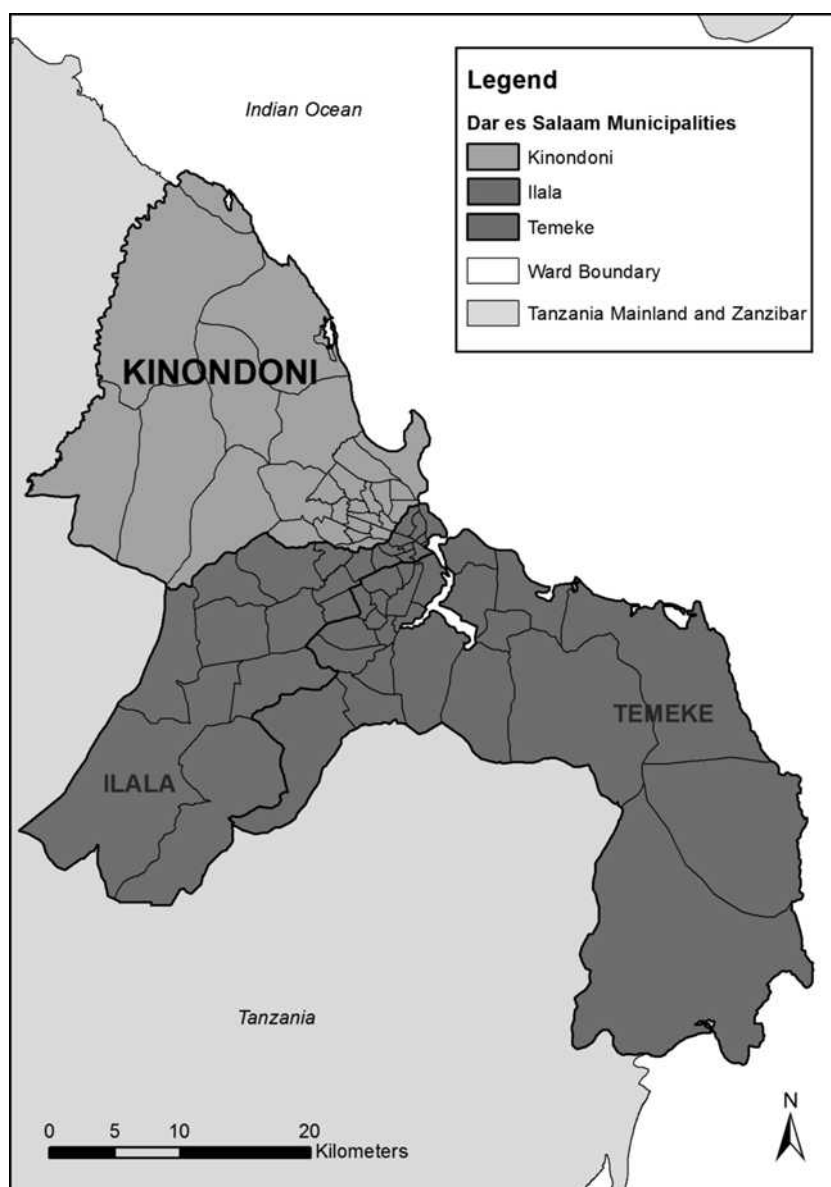


Figure 4.1: Kinondoni Municipality Map, Spatial Distribution by Wards

4.1.2 Climate

Kinondoni Municipality being one of the three Municipalities in Dar es Salaam city experiences a modified type of equatorial climate. It is generally hot and humid throughout the year with an average temperature of 29 °C. The hottest season is from October to March while it is relatively cool between May and August with temperature around 25°C. There are two rain seasons: - short rain from October to December and long rain season between March and May. The average annual rainfall is 1300mm. Humidity is around 96% in the mornings and 67% in the afternoons. The climate is also influenced by the Southwest monsoon winds from April to October and Northeast monsoon winds between November and March.

4.1.3 Administrative Setting

Kinondoni Municipality comprises of four (4) divisions namely: Magomeni, Kinondoni, Kibamba and Kawe. These divisions are then divided into twenty seven (27) wards, which are further sub divided into sub-wards commonly known as “Mitaa” (plural). There are 127 Mitaa. The Municipality also has 3 electoral constituencies namely: Ubungu, Kawe, and Kinondoni. The Municipal governing body is the Full Council which comprises of 48 Councillors. Figure 4.2 shows the administrative structure at ward level. A detailed organizational structure of Kinondoni Municipal council is depicted in Figure 4.3.

The Municipality executes its administrative duties through:

- The Municipal Council,
- Ward Development Committees under the Chairmanship of the Councillor and
- Sub-Wards (Mitaa) Development Committees

ADMINISTRATIVE STRUCTURE AT WARD LEVEL:

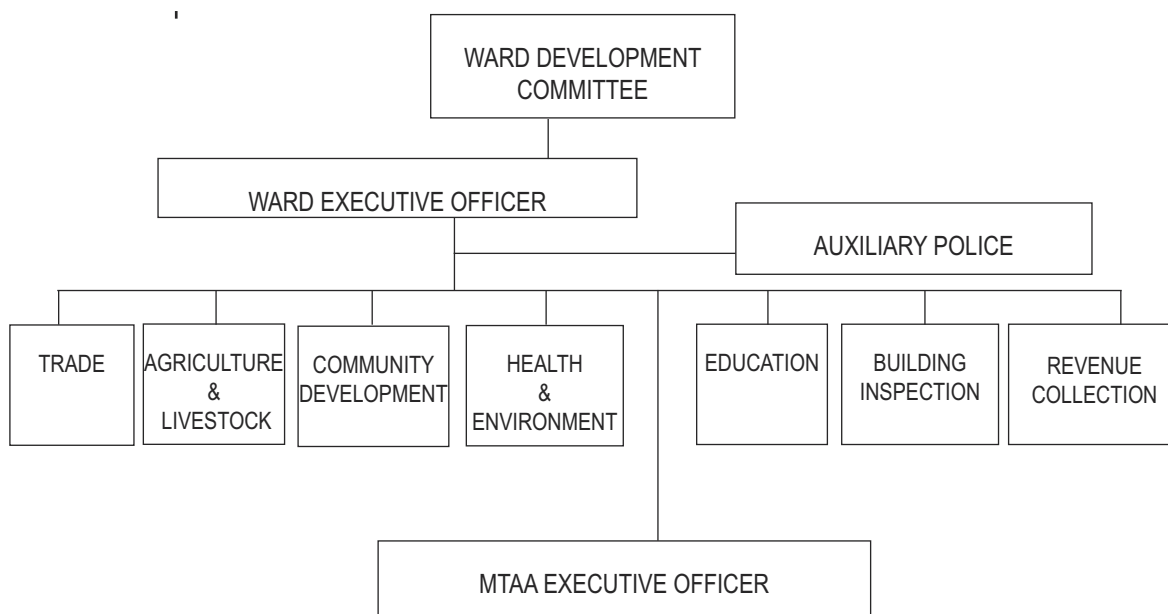


Figure 4.2: Administrative Structure at Ward Level
(Source: Kinondoni Municipal Council, 2007)

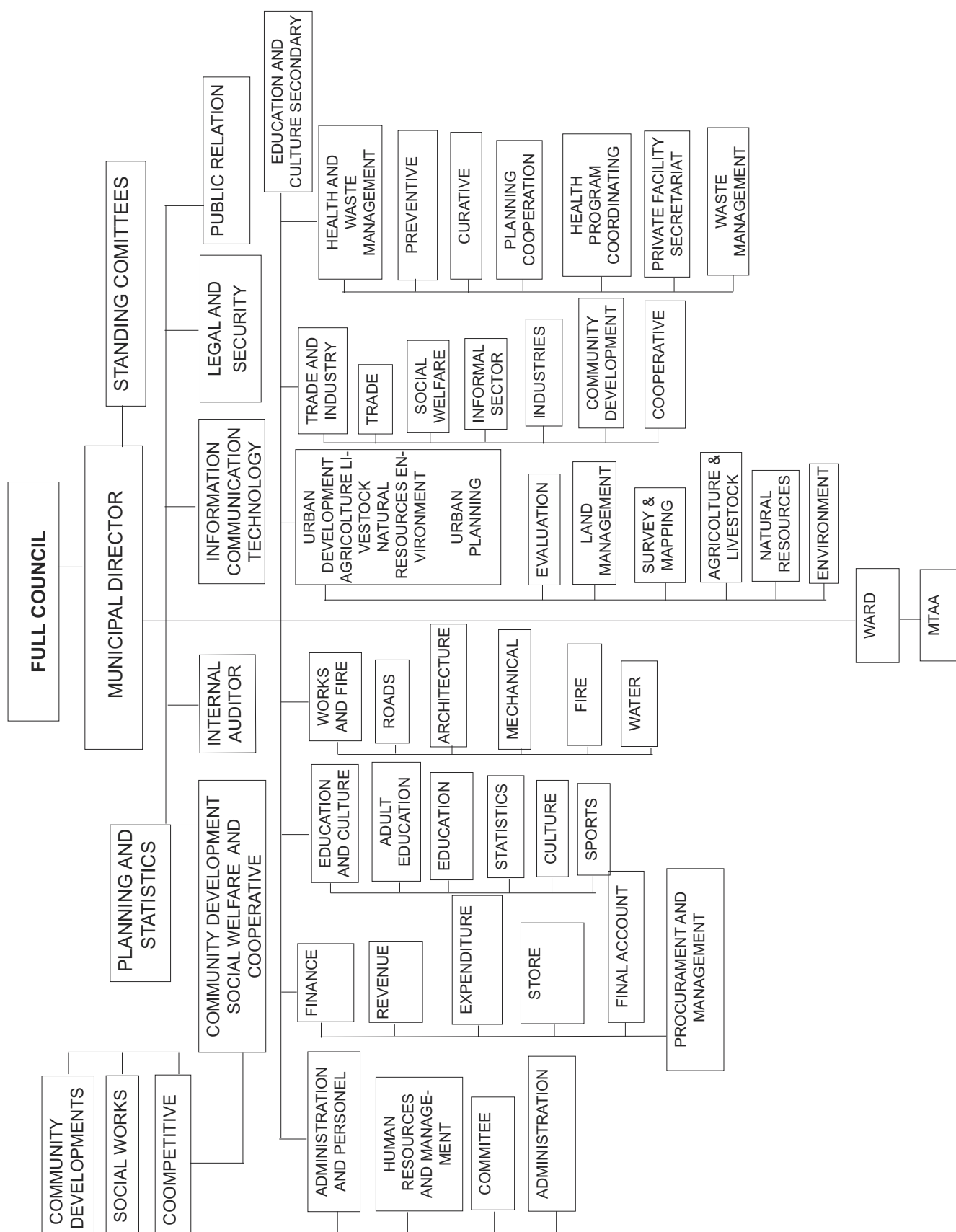


Figure 4.3: Kinondoni Municipal Council Organization Structure
(Source: Kinondoni Municipal Council, 2007)

4.1.4 Population

According to the 2002 Census, the Kinondoni Municipality had a population of 1,088,867 with a growth rate of 4.1%. The rapid population increase is influenced by both natural causes and immigration (birth rates and net immigration rates, respectively). The Municipality has an area of 531 km² and the population density is estimated at 2051 persons per square kilometre. According to the population projection done by the municipality, it was expected that by 2010 the population will be around 1,500,000 (Figure 4.4). The present (2011) population of the municipality is estimated to be about 1,564,000. Population of wards of Kinondoni municipality is shown in Table 4.1.

Table 4.1: Population of Some Wards in Kinondoni Municipality

S/N	WARD	MITAA	MALE	FEMALE	TOTAL
1	Kawe	6	48,058	46,477	94,535
2	Mbweni	3	1,865	1,610	3,475
3	Kunduchi	7	38,251	34,676	72,927
4	Msasani	5	21,792	21,665	43,457
5	Bunju	5	10,668	10,200	20,868

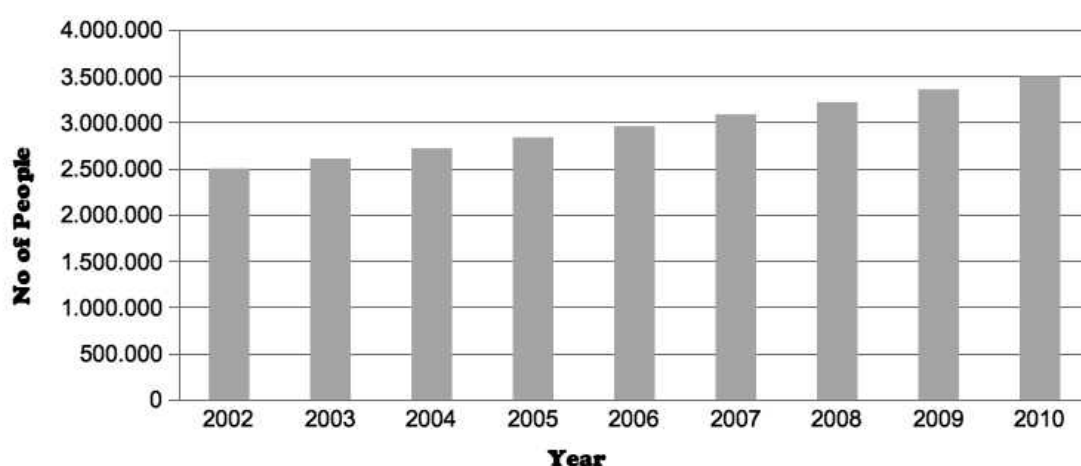


Figure 4.4: Population Projection Based on 2002 Census (Growth Rate Equal to 4.1%)

(Source: Kinondoni Municipal Council, 2007)

4.1.5 Employment and Economic Activities

It is estimated that 360,000 residents of Kinondoni Municipality are employed in both private and public sectors. Out of these, 95% are employed in the private sector while the rest 5% are employed in the public sector. A working force of 200,000 people is self-employed. The majority of the residents are involved in petty business, fisheries, livestock keeping and agriculture including horticulture. Only 3% of the working force is engaged in subsistence agriculture in the peri-urban areas. There are no big farms but small plots ranging from 2.5 to 6 acres. Others have small gardens around their houses in which various vegetables and root crops like cassava and sweet potatoes are grown for family food and the surplus for income generating (Kinondoni Municipal Council, 2007).

4.1.6 Services Provided by the Kinondoni Municipal Council

The Kinondoni Municipal Council provides the following services: Council affairs, health, solid waste management, infrastructure including roads, natural resources, trade and informal sector development, urban development, legal issues, education and culture; agriculture and livestock, water, cooperative development, community development, and information and communication technology development.

4.2 Findings of Questionnaire Survey

4.2.1 General Information on Respondents

Working experience, gender distribution and age of respondents

The target was to interview 16 members of staff in Kinondoni Municipal Council. However, thirteen members of staff from different departments were able to be interviewed. About 54% of the interviewees were male while the rest (46%) were female (Figure 4.5).

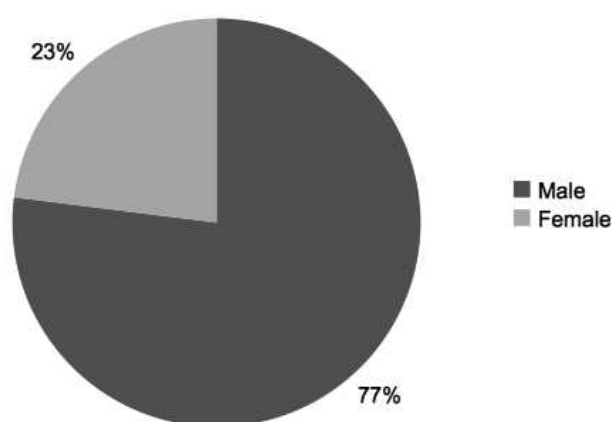


Figure 4.5: Gender Distribution of Respondents (Kinondoni)

About 54% of the respondents have spent between 10 and 20 years (Figure 4.6) working for the Kinondoni Municipal Council. Therefore, it may be assumed that their working experiences are adequate to enable them to observe any significant changes in development and environmental conditions in peri-urban areas of the municipality.

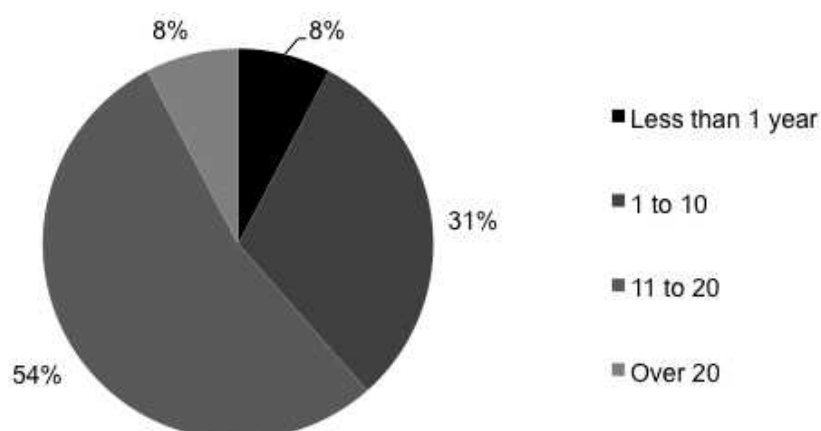


Figure 4.6: Staff Working Experience at Kinondoni Municipality

A large number (38%) of Kinondoni Municipal Council members of staff interviewed are between 51 and 60 years. In most cases, leaders and decision makers in Government organizations fall in this range of age. The smallest proportion (8%) of employees consists of youth aged between 21 and 30 years (see Figure 4.7). Information on education backgrounds and positions held by interviewees are presented in Table 4.2.

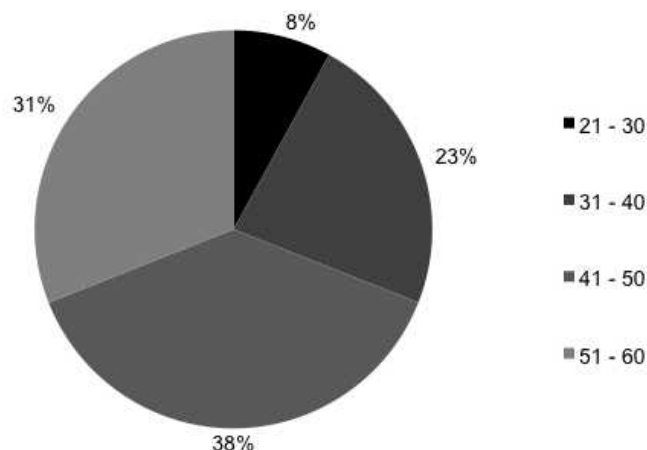


Figure 4.7: Age Distribution of Respondents (Kinondoni)

Table 4.2: Personal Information of Interviewees

M = Male and F = Female

S/N	Gender	Age (years)	Education	Position	Department/section
1	M	53	Form IV	Livestock specialist	Agriculture/livestock
2	M	52	MA. Demography and applied statistics	Principal Agricultural training officer I	Agriculture/livestock
3	F	48	MBA. Agro business	Agricultural officer (marketing)	Agriculture/livestock
4	M	57	BSc. Botany and Zoology	Principal forest officer	Natural resources and tourism
5	F	39	Advanced Diploma Sociology	Community development coordinator	Natural resources and tourism
6	F	45	Primary School	Bee keeping officer II	Natural resources and tourism
7	F	52	M.Sc. Sociology and Social works	Community development officer	Community development
8	M	27	B.Sc. Environmental Health	Environmental Health officer	DMO office
9	F	50	M.Sc. Regional Planning	Head of urban development section	Urban planning
10	M	32	B.Sc. Environmental Health	Environmental Health officer	District Medical office
11	F	45	M.Sc. Environmental Planning	Environmental Planning officer	Urban planning
12	M	48	M.Sc. Environmental and Water Resources Management	Municipal water engineer	Water
13	M	38	M.Sc. Environmental Engineering	Water Engineer	Water

4.2.2 Staff Responsibilities and Working Experience

It was found that almost all respondents are involved in natural resources management directly or indirectly through preparation of development and land use plans in their day-to-day activities. Some of them are involved in administrative duties which support the core functions of the Municipal Council. As stated previously, most of the respondents have been employed by the Kinondoni Municipal Council for a sufficient period of time to be able to observe significant environmental changes taking place in peri-urban areas and the respective remedial measures undertaken by the Municipal Council to minimise their impacts.

4.2.3 Administration Linkages between Municipality and Ward/Mtaa

Administratively, municipal councils are responsible to the Ministry of Regional Administration and Local Government in the Prime Minister's Office. Almost all respondents are aware of the administrative structure of the Municipal Council. Sections and departments in the municipal council receive directives from respective ministry (s) and implement them depending on the nature of activities they are mandated to perform. For example, the Ministry of Lands, Housing and Settlements Development works closely with the Urban Planning Department in issues pertinent to urban planning and regulation and control of urban development.

In lower levels i.e. ward and "mtaa", the Municipal Council works in close collaboration with WEO/MEO office. Figure 4.3 shows the administrative structure at ward level. It is apparent from Figure 4.3 that the administrative structure at ward level is comparable to that of the Municipal Council in terms of composition. The WEO office comprises of various sections similar to those at Municipal Council level including trade, community development, health and environment, building inspections, agriculture and livestock, education, and revenue collection.

Therefore, WEO links the community to the municipal council through the ward officers in each section. According to the respondents, the linkage and services delivery system in the WEO office has been observed to be effective.

4.2.4 Policies, Plans and Strategies for PU Areas Development

Generally, policies and bylaws for peri-urban and urban areas of Dar es Salaam City are the same. However, some respondents were able to pinpoint some specific plans and/ or strategies germane to peri-urban areas in the Kinondoni Municipality as Table 4.3 shows.

Financial supports for implementation of various activities, projects and strategies in the municipality come from various sources including the Government of Tanzania, World Bank, European Union and development partners (Table 4.3).

Table 4.3: Specific Strategies/Plans in Various Sectors in Kinondoni Municipality

Sector	Policy/Strategy/Plans	Targeted Areas	Description
Water	Water supply project commonly known in Kiswahili as "Mradi wa vijiji Kumi"	Msumi, kibwegere, king"ong"o, kilungule, Boko-dovya, mabwepande, msigani, mpiji-magohe, mpopo and makabe	Funded by the World Bank with the aim of minimizing water shortage problems and improving sanitation in rural and peri-urban areas
	Community water supply and sanitation project	Low income and peri-urban areas (Kibamba, Mburahati and Tandale)	The project is funded by European Union, Belgium and Government of Tanzania while KMC and Belgium Technical Cooperation (BTC) facilitate the project implementation
Settlements	Establishment of satellite towns	Bunju and Kibamba	The objective is to decongest roads in Dar es Salaam City by decentralizing social service delivery through establishment of satellite towns.
Agriculture and livestock	Oligon and future project	Along Mpiji river	Livestock and agriculture project to be implemented within 200m riparian zone from the river banks
Environmental conservation	Tree planting and soil erosion prevention	Along Mpiji river	Involves both the Government and private partners

4.2.5 Social Services Delivery in Pu Areas

Transport

According to the respondents, in PU areas the public transport system is not reliable compared to other parts of the city. However, they reported the wide spread use of motorcycles and tricycles as most of PU areas have not yet been officially assigned city bus routes due to few residents living in scattered settlements.

Energy

Most of the residents in PU areas use kerosene for lighting and charcoal for cooking. However, some of these areas have access to the national power grid whereby electricity is used for lighting and other domestic uses.

Water

Almost all respondents mentioned water shortage as one of the most challenging problems in PU areas. Some areas already have the water distribution network but the supply is erratic. Therefore, residents of these areas depend mainly on buying water from water vendors at prices higher than that charged by the water utility company.

Another source of water supply in PU areas is groundwater from deep and shallow wells. On the other hand, groundwater is of low quality in terms of hardness, total dissolved solids (TDS), electrical conductivity, chloride, and sulfate. For example, according to the Water Municipal Engineer, groundwater quality analysis conducted by the Municipal Council in different PU areas including Mbweni-mpiji, King"ong"o (63m deep), Kiluvya (18m) and Mbezi Juu (60m) revealed that levels of

the above mentioned parameters were higher than the threshold values specified in Tanzania Portable Water Quality Standards.

Waste management

Currently, solid waste management is not a big problem in PU areas due to the availability of land for disposal. Burying and burning are the common disposal options used. Some residents practice open dumping where by solid waste is crudely dumped in their plots or farms.

4.2.6 Developmental Changes in Peri-Urban Areas in Past Years

The respondents reported that there have been gradual developmental changes in Peri Urban areas of Kinondoni Municipality. The following are general changes as reported by respondents.

Improvement in Human settlement

This includes the improvement of housing condition from thatched/mud houses to modern houses built using industrial construction materials. The standard of living of people in PU areas notably in Bunju, Kunduchi, Mbweni and Mivumoni has been observed to have improved. This is because the indigenous people sold their land to the land speculators at reasonable prices and used the money to erect modern houses. Moreover, provision of social and physical infrastructure services such as transportation, electricity, water, waste management, education and health has improved to a reasonable extent.

Transformation of land from agricultural to residential and commercial use

According to most (96%) of the respondents, transformation of land use has been a continuous process whereby people who had large farmland sell some portions of it to others. In addition to this willful selling of portions of privately owned land, the Government has implemented a number of projects on surveying and allocation of plots in PU areas including Bunju, Mbweni and Mivumoni. People who had large portions of land in PU areas were required by the Government to have their land surveyed at their own cost. This was observed to be beyond the financial capability of most of the dwellers of PU areas as a result they surrendered most of their land to the Government. However, they were able to retain small portions of land for their own use. The rest of the privately owned land was surveyed and apportioned by the Government and sold. This process led to the transformation of land from agricultural into residential and commercial use.

Establishment and improvement of social services

The transformation of agricultural land into residential and commercial uses was accompanied with the expansion of social services including improvement and construction of schools, health facilities and markets.

Improvement of agriculture and livestock keeping

There has been improvement in agriculture and livestock extension services especially in peri urban area through the Government strategy known as District Agricultural Development Plans (DADPs). Through this strategy, the Government is providing subsidy for agricultural inputs particularly fertilizers and seeds as an incentive to farmers to produce more and quality agricultural products.

Increase in self-employment opportunities

This is due to the establishment of various production groups under the Government facilitation as well as the establishment of affordable and easily accessible credit facilities such as community banks and SACCOS.

Improvement in environmental conservation activities

There have been some efforts on protecting the environment under the environmental conservation strategy. For example, raising of tree seedlings at Boko Nursery, distribution of tree seedlings, provision of extension services to the community based organizations involved in protection of forests and planting of trees in PU areas.

Improvement of transport system

Mode of transport has significantly changed in most PU areas due to the introduction of motor cycles and tricycles. In areas where people had to walk for long distances in the past, motor cycles and tricycles are used for providing affordable transport.

4.2.7 The Main Linkages and Interdependences between Peri Urban Areas and City Centres and Peri Urban Areas and Rural Areas

Most of the respondents had some insights on the linkages between PU areas and the City Centre as well as PU and rural areas. The following is a summary of responses from interviewees.

- Producer and consumer relationship: It was reported that agricultural and animal products such as vegetables, fruits, honey and milk produced in PU areas are sold to consumers in the city centre.
- Movement of people between peri-urban and the City Centre: Most of the offices and important services are located in the City Centre. Consequently, people have to commute between PU areas and the City Centre on daily basis for office work and trading. This is one of the main reasons for traffic jams in Dar es Salaam City roads.
- Available of job opportunities in the City Centre: Job seekers from peri urban areas commute to the city centre in search for casual and while-collar jobs.
- The same relationship exists between peri urban and rural areas whereby people from urban and peri urban area invest in rural areas especially through purchasing of large farms for crop cultivation and livestock keeping. Furthermore, people in rural areas are the main producers of agricultural and livestock products, which are consumed in peri urban and urban areas.

4.2.8 Groups of People, Networks and Organizations Operating in Peri Urban Areas

Some respondents were well informed on the existence of informal and formal networks, groups of people and organizations actively operating in peri urban areas. Some of the groups were formed under the influence of a project known as STOA which was facilitating the formation of CBOs and groups for urban agriculture such as horticulture and livestock keeping. However, most of the respondents seemed to be unfamiliar with the roles of the organizations. Some of the groups and networks identified to operate in peri-urban areas include:

- 1) SACCOS. For example, those found in Bunju, Mpigi, Mabwepande, etc.
- 2) Community banks. For example, Dar es Salaam Community Bank and Akiba Commercial Bank and Women Banks
- 3) VIKOBA
- 4) Beekeeping groups
- 5) Food vendors groups (commonly known as „mama lishe“)
- 6) Bunju cooperative society
- 7) Plant nursery groups e.g. TETA-group found in Tegeta which is involved in the conservation of coastal mangrove trees

The most significant interaction between the Municipal Council and networks and organizations is that the Municipal Council is responsible for:

- Registration of organizations; and,
- Provision of advisory services on the operation of the organization

4.2.9 Changes in Environmental Conditions in the Past Years in Peri Urban Areas

Views were collected from respondents on the changes on environmental conditions based on specific aspects itemized in Table 4.4. In spite of being interviewed at different times, most respondents seemed to have similar views on changes in environmental conditions in PU areas. The views of respondents are summarized in Table 4.4.

Table 4.4: Views on the Changes in Environmental Conditions in the Past Years in Peri urban Areas

Environmental Aspects	Response/Comments
Water availability	<p>Water availability has been observed to be inadequate. An increase in the number of people using groundwater and rainwater indicates that there is a shortage of piped water in terms of network coverage and amount supplied.</p> <p>Furthermore, water levels in boreholes have been reported to decrease while in some of the boreholes water has been observed to becoming saline.</p>
Soil fertility	Soil fertility is decreasing due to removal of vegetation cover, improper agricultural practices and excessive irrigation which is causing leaching of soil nutrients.
Soil aridity	It was reported by most of the interviewees that soil aridity has increased due to the following reasons: removal of vegetation cover largely caused by bush fire, high population density, increased groundwater extraction and inadequate rainfall.
Humidity	Humidity has been observed to vary with time and season of the year. It is usually high during the rainy season.
Rainfall pattern	Unpredictable since it has become irregular in recent years
Others	Decreasing of natural vegetation cover and increased global warming

4.2.10 Impacts of Environmental Changes in Peri Urban Areas

Most of the respondents seemed to have some insights on the environmental impacts experienced in peri urban areas. However, no impact evaluation has been conducted so far. According to some respondents, a large number of trees is planted annually but only few of them survive due to drought and diseases. This situation is associated with environmental stresses.

4.2.11 Strategies Undertaken by the Kinondoni Municipal Council to cope with Environmental Changes and Reducing People's Vulnerability to Impacts of Environmental Changes

- Implementation of Government programme called DADPs to increase crop production as an effort to cope with decreasing soil fertility
- The Municipal Council has initiated a strategy for increasing the number of tree nurseries for production of sufficient tree seedlings. The Council's vision is to produce 1,000,000 seedlings by the end of this year (2011). The strategy is mainly focusing on planting of trees along major roads, buffer areas of rivers and open areas. Apart from the initiative of the Municipal Council, there are 238 private dealers/groups involved in producing tree seedlings in Kinondoni Municipality.
- The Municipal Council is implementing a Land Conservation Strategy through enforcement of laws and regulations as well as providing advisory services on land conservation issues. This strategy specifically focuses on conservation of greenbelts of rivers, which is a distance of 200 m from the banks on both sides of the river. No human activities are allowed within the greenbelt except for livestock grazing. A notable example is the proposed greenbelt along Mpiji River, which will protect the river from the impacts of anthropogenic activities especially farming and construction of buildings. Under the Land Conservation Strategy, there is also a project which is being implemented in Mbweni, Madale and Magereza-Boko areas on sustainable agriculture including planting of trees.

4.2.12 Autonomous Adaption Activities to Environmental Changes in PU Areas

Most of the respondents could not comprehend about autonomous adaption activities to environmental changes in peri urban areas except for those dealing with environment related issues especially officials from departments responsible for natural resources, agriculture and livestock. The responses pertinent to autonomous adaption activities to environmental changes in peri urban are summarized in Table 4.5.

Table 4.5: Autonomous Adaptation to Environmental Changes

Activity	Response/Comments
Change in crop system	Organic farming and irrigation Application of zero tillage method Use of drip irrigation for optimization of water use Mulching to conserve water in the soil Cultivation of vegetables and fruits in hanging containers containing soil.
Change in livestock	Shifting pastoralism Artificial insemination to produce offspring, which are capable of resisting harsh environmental conditions and diseases Harvesting of rainwater for human consumption and livestock watering Reduction in the number of animals and adaption of zero grazing
Change in house structure	No adaption measures were reported

4.2.13 Baseline Study on Peri Urban Environment, Dwellers and Livelihood

This information could not be obtained since all respondents reported that they have not come across a report on specific studies, which have been conducted in peri urban areas.

4.2.14 Reasons for Environmental Change

The respondents had different views on the causes of the environmental changes. The general outlook of the respondents based on four pre-defined causes of environmental changes is presented in Figure 4.7. In Figure 4.7 „others“ refers to an increase in the number of industries and motor vehicles.

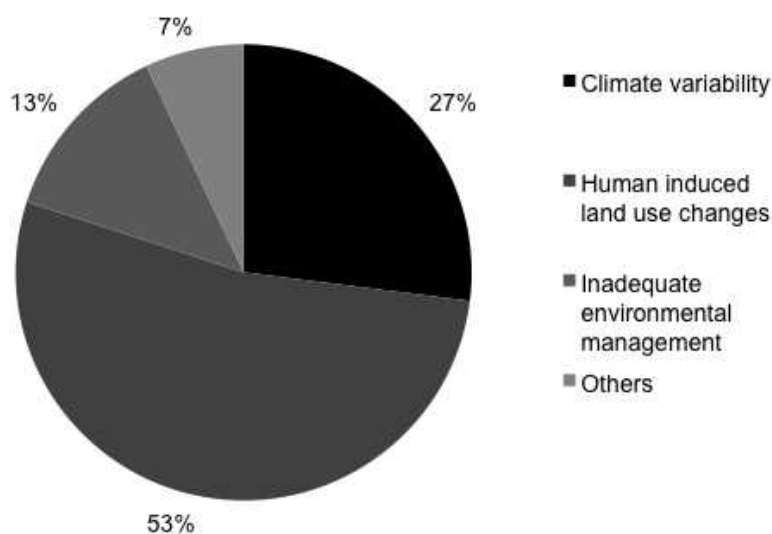


Figure 4.8: The General Outlook on the Causes of Environmental Changes

4.3 Conclusion and Recommendations

It has been observed that most of the respondents seemed to be familiar with the term climate change. However, they lack the capacity to empower residents of PU areas with necessary tools and skills for enabling them to cope with the changing environmental conditions and the associated impacts. Existing plans, strategies, projects and programs are largely focused on environmental protection and conservation rather than climate change and adaptation. Mainstreaming of climate change issues in development plans, strategies, programmes, projects as well as routine activities is yet to be done and approaches to effect the same are vaguely understood by the Municipal officials interviewed. It was further observed that the respondents have a limited analytical capability to effectively analyze climate change potential impacts and to develop viable adaptation measures. Therefore, to enable the Municipal Council implement the National Adaptation Programme of Action there is dire need to enhance their understanding in issues pertaining to climate change impacts to enable them help the city dwellers in devising pragmatic adaptation and coping strategies.

5 Temeke Municipality



5.1 Temeke Municipality Physical and Social-Economic Characteristics

Temeke District is the southernmost of the three municipalities of Dar es Salaam Region. Kinondoni is located to the far North of the city, while Ilala Municipality occupies the location between Temeke and Kinondoni Municipalities. The Central Business District of Dar es Salaam City is primarily in Ilala Municipality. To the East of Temeke Municipality is the Indian Ocean and to the South and West is the Coastal region. The location of Temeke Municipality and its spatial relationships with the other municipalities is shown in Figure 5.1.

Like Ilala and Kinondoni Municipalities, Temeke is an administrative district within Dar es Salaam Region. It consists of twenty four wards (See Figure 5.1). The Temeke Municipal Council jurisdiction covers an area of approximately 631 km². Part of the Temeke Municipal area is occupied by manufacturing industries (heavy and light industries). The Dar es Salaam Port, which is the largest port in the country, is also located in Temeke District.

The present population (2011) of Temeke is estimated to be above 1.2 million people (Kagimbo, 2010) with an annual growth rate of 4.6% (Census, 1998-2002).

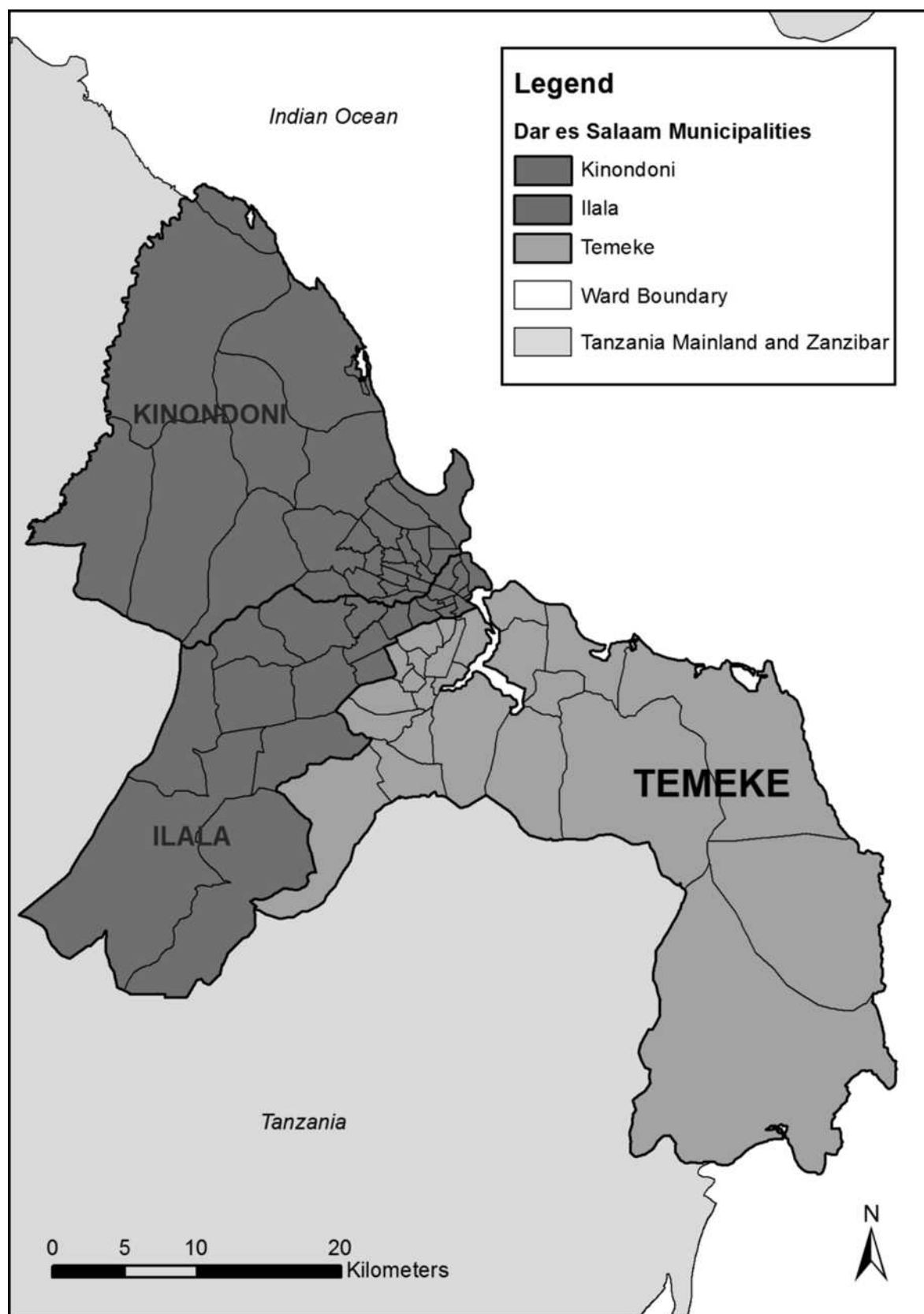


Figure 5.1: Dar es Salaam City Administrative Boundaries

5.2 Findings of Questionnaire Survey

5.2.1 Work Experience, Gender Distribution and Age of Temeke Municipal Council Respondents

A large number (42.9%) of the respondents have work experience of between 6 and 10 years while a small percentage (7.1%) have work experience equal to or more than 16 years as Figure 5.3 illustrates.

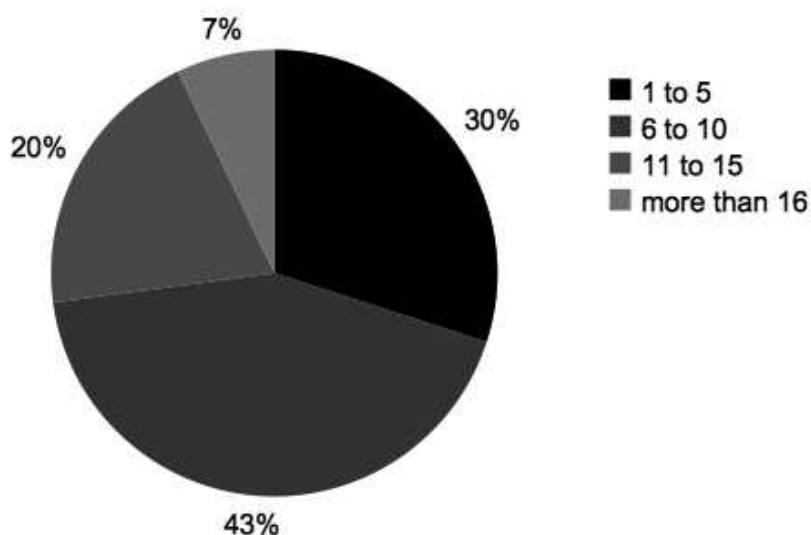


Figure 5.3: Staff Working Experience of Temeke Municipality

With respect to gender distribution, the survey revealed that 86% of the respondents were males while the remaining 14% were females. Therefore, it is indisputable that the gender profile of the respondents was biased in favour of males.

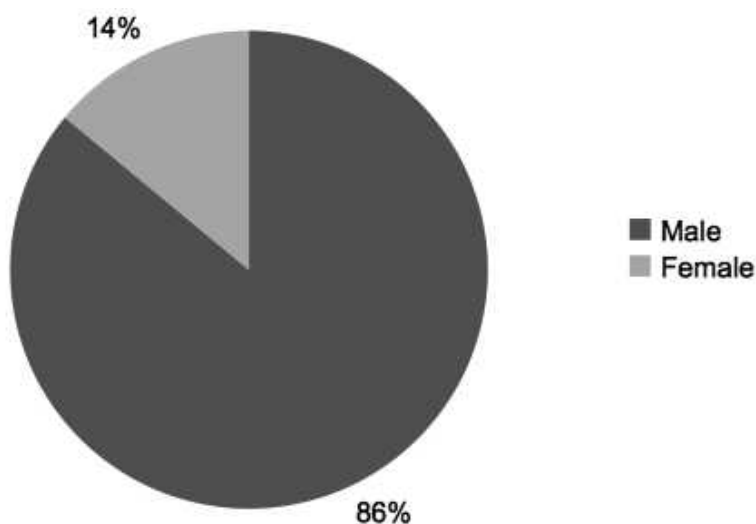


Figure 5.4: Gender Distribution of Respondents (Temeke)

A large proportion of the respondents (57%) were above 46 years of age. As evident in Figure 5.3, 21% of respondents were between 36 and 45 years old while the age of 22% of interviewees ranged from 18 to 35 years (Figure 5.5).

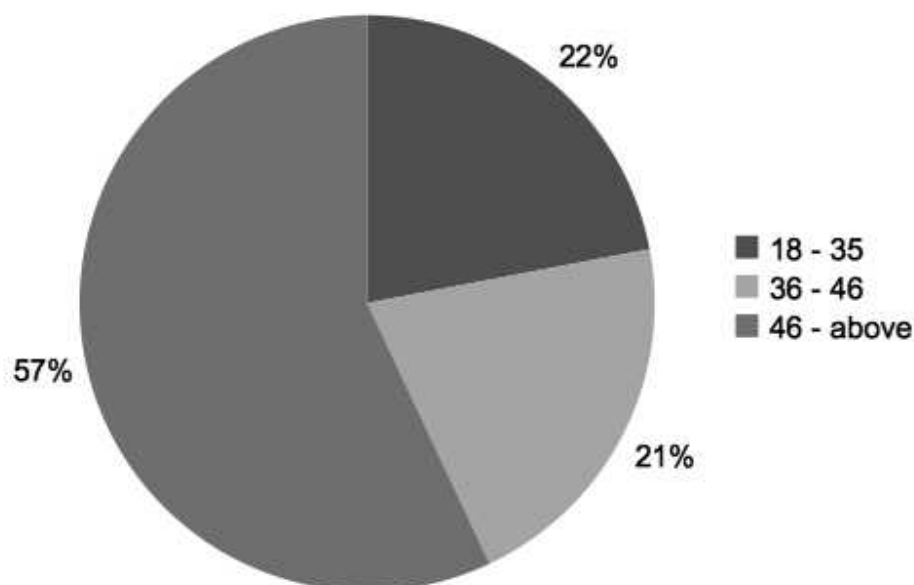


Figure 5.5: Age Distribution of Respondents (Temeke)

5.2.2 Competence Areas and Responsibility of Temeke Municipal Council

As Table 5.1 shows, most of the respondents (28.6%) are involved with activities, which fall under the category of natural resources management. Natural resources management encompasses surface and ground water management, forestry and wild life management, management of the marine environment, including mangrove forests. Respondents who belong to the category of land use planning (21.4% of the total) are specifically involved in land use planning which includes allocating plots to customers and coordinating the whole process of implementing land use plans and controlling and regulating urban development in the municipality

Table 5.1: Competence Areas and Responsibilities of Interviewees

Category	Percentage (%)	Responsibilities
Land surveying	7.2	Allocation of plots, demarcation of boundaries of plots
Natural resources management	28.6	Surface and ground water management, management of the marine environment (including mangrove forests) and forests management
Land use planning	21.4	Coordinating the implementation of land use plans
Livestock production	7.1	Livestock production in peri-urban areas
Health officers	14.3	Combating drug abuse and coordination of implementation of health programs
Solid Waste manager	14.3	Overseeing waste handling
Agricultural extension officer	7.1	Demarcating land for agricultural activities and encouraging vegetable production in peri-urban areas

With each accounting for 14.3% of the total number of the municipal council staff, apparently health and waste management activities in the municipality are accorded the same weight. It is noteworthy that, although Temeke Municipality is essentially an urban area, agriculture is held in such a high esteem that agricultural extension services are allocated staff (7.1%). This can be taken to mean that the contribution of urban agriculture to the livelihoods of Temeke Municipality residents is given recognition by Temeke Municipal Council.

5.2.3 Main Relationships between Temeke Municipal Council and Higher Level and Lower Level Institutions

Opinions on interrelationships between the municipal level and upper as well as the lower level government institutions were sought from the respondents. Practically all the respondents characterised the relationships as being both "top - down" and "bottom - up". This suggests that flow of information occurs both towards the top and towards the bottom. By the same token, decisions are made at all administrative levels. The respondents additionally made the following remarks regarding the role of the municipal councils:

- To act as a bridging link in policy implementation between the central and local governments;
- As experts, municipal officials are there to carry out orders from higher administrative levels (ministry and city council) so as to give a professional interpretation for disseminating them to institutions under their areas of jurisdiction (wards, sub wards and villages);
- Identifying and analyzing various problems arising in peri-urban areas and providing solutions where possible;
- Establishing and implementing a standardized approach for the collection and analysis of various problems in wards, sub-wards and villages;
- Reporting on various development activities and campaigns taking place in lower level institutions;
- Issuing or facilitating issuance of permits and licenses for various development undertakings in the respective official area of jurisdictions.

5.2.4 Strategies, Programmes or Plans under Implementation in PU areas of Temeke municipality

Information on strategies, programmes or plans under implementation in peri-urban areas of Temeke Municipality was also sought from the respondents. Specific interest was on the following areas:

- Environmental risk management
- Sustainable natural resources management
- Land use planning
- Facilities supply
- Urban/or rural development

Officials in the department of land use planning described a rural development program which is taking place in Gezaulole area in Kigamboni peninsula. Gezaulole is a peri-urban area which is planned to be transformed into an urban area by the Temeke Municipality. The project will involve resettlement and displacement of residents and property owners. Property valuation has been completed and the affected community has already been compensated. A total of 841 plots are to be surveyed in an ongoing survey.

Another ongoing programme, which is referred to as "Sustainable Fisheries Management in Coastal Belt of Dar es Salaam" pertains to fisheries. The programme focuses on promoting sustainable fishing and conserving endangered marine life such as turtles and other related species.

It was observed that people especially fishermen are the biggest threat to turtles. People hunt turtles for their meat, eggs, and shells. Urbanization on the other hand was said to be the biggest remote cause for endangering marine resources. According to the fisheries officer, some species of turtles have already become extinct.

Other ongoing projects that were identified by the respondents from the Temeke Municipal Council pertain to:

- Malaria Larviciding project for Dar es Salaam.
- Clean Cities" programme (community supervision).
- Sustainability of urban agriculture especially in peri-urban areas
- Regularization of unplanned settlements.
- Rural water supply and Sanitation program (RWSSP), whose focus is on provision of clean and safe water in periurban areas. The program is ongoing and is being conducted in collaboration with the Ministry of Water since 2006/7.
- Environmental risk management with respect to overgrazing to maintain environmental sustainability.

5.2.5 Strategies and Policies for Peri-Urban Areas

Regarding the existence of strategies and policies for peri-urban areas, all the respondents concurred that there is no policy specifically intended to address peri-urban area needs. They, however, observed that sector-specific policies such as those pertinent to the environment and water integrate needs of activities that take place in peri-urban areas.

5.2.6 Sources of Funds for Project Implementation

Sources of funds for implementing various projects in Temeke Municipal Council were identified as loans and grants from: Donor Agency Development Projects (DADPs), the World Bank (WB), African Development Bank (AFDB), United Nations Children Fund (UNICEF), WaterAid (a UK based non-government organisation), Tanzania Social Action Fund (TASAF), Tanzania Investment Bank (TIB), European Union (EU), and internal sources (ministries, district councils).

5.2.7 Current Status of Provision of Social Services in Peri-Urban Areas

Opinions of the Temeke Municipal Council respondents regarding the current status of various technical and social services in peri-urban areas were as shown in Table 5.2.

Table 5.2: Opinions on Current Status of Technical and Social Services

Service	Transport system	Electricity	Water	Waste management	Education	Health
Very Good	0	0		0	1	
Good	2	2	2	2	0	1
Fair	2	2	2	0	0	0
Poor	2	3	3	4	4	5
Very poor	0	0	0	0	0	0

With reference to Table 5.2, the respondents made the remarks listed below to qualify their responses regarding the quality of the services provided in peri-urban areas.

Transport

- The transport system is in good condition because, there are main roads connecting peri urban areas with the municipality.
- Road infrastructure is in a good condition but the transport system is still a problem, mainly because commuter buses are fewer than required. However, some of roads in peri-urban areas are in poor conditions. For example, some can only be used during the dry season.

Electricity

- Most peri-urban areas are not supplied with electricity.
- Water is supplied in a sufficient amount since most of PU areas are less populated
- Some peri-urban areas are not yet provided with a formal water supply service.

Waste management

- In peri-urban areas there are no problems of environmental pollution.
- Onsite waste handling (incineration) is practiced in hospitals

Education

- Each ward has a primary school.
- There is shortage of teachers and laboratories facilities are insufficient.
- There are at least primary and secondary schools in every ward.

Health

- Each ward has a health center.
- The health facilities are not provided with enough nurses and doctors.
- There is a shortage of medicine.

5.2.8 Observed Past Developmental Changes in Peri-Urban Areas

Regarding whether they had noticed any developmental changes in peri-urban areas in the past few years, 87.5% of the respondents responded affirmatively. Qualifying observations given by the respondents are summarized as follows:

- Rapid urbanization is taking place in peri-urban areas and as such what is defined a peri-urban area today becomes a densely populated area in a short period of time (five years or less).
- Rapid changes that take place in the peri-urban areas are not accompanied by corresponding improvements in provision of services such as water, electricity, solid waste management and wastewater.
- Rapid urbanization results in emergence of unplanned settlements since there is no master plan in place to guide development whose requirements are followed by all in the city.

5.2.9 Main Linkages and Interdependencies between Peri-Urban Areas, City Centre and Rural Areas

Regarding the issue of main linkages and interdependencies between peri-urban areas and city centre as well as between peri-urban areas and rural areas and if there are any notable changes in these relationships in the past years, the respondents made the observations listed below.

- Peri-urban areas have been absorbing the population that spills over from the City Center. For example, many people work in City but live in peri-urban areas.
- Activities in the City center create good markets for products from PU areas. For example, often peri-urban areas provide a source of various types of green vegetables and other food products such as eggs, milk and fruits. ☺ Some peri-urban areas are used as disposal areas for solid and liquid wastes generated in the city center.
- The interdependencies between the City center and the PU areas could have been even better if infrastructure such as transport system were improved.

5.2.10 Informal or Formal Networks, Groups of People, Organizations, Relations of Trust and Mutual Support Operating in PU Areas.

The majority of the respondents (87.5%) were not able to satisfactorily discuss the issues pertinent to informal or formal networks, groups of people, organizations (such as NGOs, CBOs and SACCOS), and relations of trust and mutual support that exist in peri-urban areas. However, the few who responded to the issue pointed out the following:

- There are a number of community based organizations (CBOs) dealing with various activities in peri-urban areas such as solid waste collection and disposal, community based security (guarding) service provision, land surveying, goat and cattle keeping, patrolling against illegal fishing, horticulture and a number of Savings and Credit Cooperative Society (SACCOS) branches.
- Relevant networks, groups of people, and organizations that operate in Temeke municipality include: CARITAS Tanzania, which deals with assisting farmers and schools, FARMBASE, which deals with provision of farm implements such as veterinary drugs and insecticides, DAR ZOO, which deals with the provision of good breeds of dairy cattle, goats, and other related domestic animals.
- Municipal officials responsible for the issues pertinent to the activities of the relevant networks, community groups, and organizations ensure that the networks, community groups, and organizations abide by all the laws and regulations that govern their operation in order that they play their intended roles in community development.

- The major roles of the relevant municipal officials with respect to the networks, community groups, and organizations as explained by the municipal officers includes:
 - 1 Registering such networks and NGOs in order that they are legally recognised and operatin
 - 2 Making a close follow-up to see whether those networks abide to terms of agreement with the municipal council.
 - 3 Assisting such NGOs, CBOs, SACCOS and FBOs in various campaigns if any
 - 4 Providing technical assistances whenever needed.
 - 5 Provision of subsidies and training to CBOs, and SACCOS
- Based on experiences of the municipal officials, the networks, community groups, and organiza-
tions rarely participate in the municipal decision making process.
- A non-governmental organisations known as Youth Vision, which is based in Kigamboni, deals
environmental sustainability and prevention of illegal fishing by way of patrol against illegal fishing,
Kibugo crab fattening CBO dealing with crab fattening project along Temeke coastline. NGOs
dealing with combating drug abuse, HIV AIDS testing campaign are also working with Temeke
Municipal Council

5.2.11 Notable Changes in Environmental Conditions in the Past Years

Many of the respondents (28.6 - 87.5%) admitted that they had observed notable changes in environmental conditions with respect to water availability, soil fertility, soil aridity, humidity, and rainfall pattern in the past years. Table 5.3 summarises the survey findings on this issue.

Table 5.3: Opinions of Municipal Officials Regarding Notable Environmental Changes in Peri-Urban Areas

Response	Water availability	Soil fertility	Soil aridity	Humidity	Rain pattern
Yes (%)	87.5	35.7	42.7	28.6	64.3
No (%)	0	0	0	7.5	7.5
Do not know (%)	0	0	0	0	0

As evident in Table 5.3, the majority (87.5%) of interviewees had observed changes in the availability of water. Most of the respondents' observations were centred on the following:

- Drying of water wells
- Shortage of rainfall hence drought
- Unpredictable rain pattern
- Loss of fertility in the soil which forces farmers to use organic manure

5.2.12 Evaluation of Impacts of Environmental Changes in PU Areas and Implementation of Strategies to cope with the Changes

The issue on evaluation of impacts of environmental changes in per-urban areas and implementation strategies to cope with the changes drew mixed responses as shown in Table 5.4.

Notably, the majority (42.9%) of the respondents admitted that they had not known of any formal evaluation on environmental changes that have taken place in peri-urban areas.

Table 5.4: Responses of Municipal Officials on whether any Evaluation has been done on Environmental Changes in Peri-Urban Areas

Response	No of respondents	Percentage (%)
Yes	3	21.4
No	5	35.7
Do not know	6	42.9

The 21.4% of the interviewees who responded affirmatively to the question, pointed out several areas where impacts of environmental changes have been observed. They specifically noted the following:

- Decrease in crop production in many parts of PU areas due to drought is a clear indication of climate change (this was pointed out by agricultural officials).
- Various impacts reported in environmental impact assessments (EIAs) carried out by NEMC in collaboration with local government authority in all peri-urban areas of Temeke.

As evident in Table 5.3, a significant proportion of the respondents (35.7%) revealed that there has been no impact evaluation carried out so far. The foregoing results suggest that there is a need for raising awareness among the municipal council officials on climate change and related issues.

Responses to the issue on whether the respondents' institution is implementing any strategies to cope with environmental changes are summarised in Table 5.5. As evident in Table 5.5, the majority (50%) of the respondents are convinced that their institution is implementing some strategies to cope with the effects of environmental changes.

It is noteworthy that, while a large proportion of the respondents did not know whether any evaluation had been carried out to gauge environmental changes in Temeke municipality, 50% of the same respondents were confident that Temeke Municipal Council was implementing strategies to cope with environmental changes.

Table 5.5: Opinions on whether Temeke Municipal Council is Implementing any Strategies to cope with Environmental Changes

Response	No of respondents	Percentage (%)
Yes	7	50.0
No	5	35.7
Do not know	2	14.3

The respondents who admitted that Temeke Municipality was implementing strategies to cope with environmental changes, pointed out the following efforts in this respect:

- Tree planting programme (MACEMP) which focuses on working with community based organisations (CBOs) and the general public for restoration of the natural environment in coastal parts of Temeke.
- Implementation of the deep well (borehole) drilling projects by the Water Works Department is aiming at reducing the people's vulnerability to environmental changes by exploring and drilling boreholes to keep pace with the rapidly increasing community water demand and drying up of surface water sources.
- The Agriculture and Livestock Department is encouraging the community to reduce the number of livestock they keep and encourage sustainable live stocking (zero grazing in peri-urban areas).
- The Urban Planning Department is implementing a survey project to upgrade the outskirts of the entire Temeke Municipality which is currently considered as peri-urban area.

- The Fisheries Department is implementing a project on sustainable fishing and biodiversity restoration along the coastal belt of Dar es Salaam City.

5.2.13 Autonomous Adaptation Actions in Response to Environmental Change

Opinions of interviewees regarding the existence of autonomous adaptation actions to cope with environmental changes are summarised in Table 5.6. It is evident from Table 5.6 that although the autonomous actions taken by Temeke residents to cope with environmental changes include change in crop system, change in livestock keeping type and change in house structure, the most dominant coping strategy is changes in house structure.

Table 5.6: Opinions on Existence of Autonomous Adaptation Actions to cope with Environmental Changes (Respondents in Numbers)

Response	Change in Crop System	Change in Livestock	Change in House Structure
Yes	4	5	6
No	2	2	2
Do not know	4	4	4

The dominance of changes in house structure as a coping strategy is likely to be contributed by the fact that problems that pertain to houses affect virtually everyone because practically every resident of the municipality lives in a house. In contrast, many Temeke municipality residents neither practice farming nor keep livestock.

Additional observations made by the respondents regarding the measures taken by Temeke municipality residents to cope with effects of environmental changes include the following:

- There is a reduction in livestock size due to droughts, infertility and change of rain pattern
- Residents in peri-urban areas have abandoned some of the crops due to weather fluctuations, and shortage of land. Moreover, there is a reduction in number of livestock due to shortage of suitable pastures.
- Residents in peri-urban areas have started constructing good quality and permanent houses.

5.2.14 Availability of Information and Baseline Data on Peri-Urban Environment and Dwellers

Opinions of Temeke Municipal Council's officials on the availability of information or baseline data on peri-urban environment, and peri-urban area dwellers and their livelihoods are summarised in Table 5.7.

Table 5.7: Temeke Municipal Council Officials' Opinions on Availability of Information and Baseline Data on Peri-Urban Environment and Dwellers

Response	Employment	Population	Type and House Dimension
Yes	2	3	0
No	1	2	1
Do not know	8	8	8

From Table 5.7, it can be observed that most respondents admitted that they do not know whether the data sought for the survey are available. This implies that the data sought are not available because they are not collected. Alternatively, the required data are available but for some reasons their existence is not known to the respondents. Whether the former or the latter is correct, there is clearly a data collection or record keeping problem. In spite of the above, one respondent observed that based on 2002 national census data, about 85,000 people live in peri-urban areas in the municipality.

Although this is not clearly evident in the table, the survey question related to Table 5.7 revealed deficiencies in data collection and record keeping in the municipality. Clearly, this problem needs to be addressed urgently.

5.2.15 Opinions on Causes of Environmental Changes

Opinions of respondents on the likely causes of environmental changes observed in the municipality are summarised in Table 5.8. Clearly, all the three identified possible causes of the observed environmental changes were considered to have practically comparable influencing potential. Notably, all of them were considered to be significantly influential.

Table 5.8: Opinions of Temeke Municipality Officials on Causes of Environmental Changes

Causes of Environmental Changes Observed	Number of Respondents
Climatic variability	13
Human land use	12
Inadequate environmental management	11
Other	

Additional specific causes to which environmental changes were attributed to are the following:

- Charcoal making,
- Improper management of solid waste
- Improper land planning and land use
- Corruption,
- Air pollution, and
- Inadequate education of the general public on proper waste handling practices.

5.3 Conclusion and Recommendations

The most important conclusions that can be drawn from the information and data collected through interviews with the Temeke Municipal Council staff are the following:

- Many environmental changes which are related to climate effects have been observed in Temeke municipality. They include: changes in water availability, change in rain pattern, changes in soil aridity, changes in soil fertility, and changes in humidity.
- The environmental changes observed in the municipality are mainly attributed to climate variability, land use changes in the municipality, and poor environmental management.
- There are many cases of autonomous adaptation measures taken by residents of Temeke municipality to cope with climate change effects. Coping strategies include changes in crops grown and livestock raised and changes in house structure especially with a view to coping with flooding risks.
- Levels of awareness and general knowledge on climate change and its adaptation needs among Temeke Municipal Council staff is not sufficiently high. This implies that the capacity of the municipality to cope with the needs of climate change effects is inadequate. As such, there is a need for capacity building in this respect.
- Planned, direct involvement of Temeke Municipal Council staff in developing and overseeing implementation of strategies intended to facilitate prevention, coping and recovery from climate change effects is low. Therefore, there is a need for deliberate enhancement measures in this respect.

6 Overall Conclusion and Recommendation



With respect to the Dar es Salaam City Council (DCC) level, the following sum up the findings and recommendations from this study:

- The DCC coordinates all the administrative, planning and developmental activities that require the participation of the three municipalities and various projects, strategies, policies and programmes, which are currently being implemented. However, there are no specific projects, strategies and programs for addressing specific challenges, which are encountered by residents of the peri-urban (PU) areas.
- Most of the interviewees had the opinion that the observed changes in environmental conditions in PU areas are caused by a combination of factors which are climate variability, irrational changes in the land use and inadequate environmental management.
- Knowledge and understanding of climate change issues among the City Council employees is wanting. In view of this, integration of climate change adaptation issues in services rendered by the City Council departments will be a challenge unless the capacity of the workers in understanding of climate change issues is enhanced by putting in place a demand driven capacity building strategy.

With respect to Ilala Municipal Council, the main findings and recommendations can be listed as follows:

- Most Ilala Municipal Council members of staff are not very familiar with issues pertaining to climate change and its impacts. As a result, climate change issues have not been mainstreamed in the plans, strategies, programmes and daily activities of the departments of the municipal council. Unless awareness on issues pertaining to climate change impacts is raised among the officials of municipal council, mainstreaming of climate change issues will not be realized.
- In view of the deficiencies observed, it is important to build the capacity of municipal officials in climate change issues so as to enable them formulate plans, strategies, programmes, which will empower the city dwellers to adapt and cope with the climate change impacts.

With respect to Kinondoni Municipal Council, the following key issues sum up the findings and recommendations from this study:

- Existing plans, strategies, projects and programs are largely focused on environmental protection and conservation rather than climate change and adaptation.
- Mainstreaming of climate change issues in development plans, strategies, programmes, projects as well as routine activities is yet to be done.
- Members of staff of the Kinondoni Municipal Council have limited analytical capability to effectively analyze climate change potential impacts and to develop viable adaptation measures. Therefore, there is a need to enhance their understanding in issues pertaining to climate change impacts to enable them help the city dwellers in devising pragmatic adaptation and coping strategies.

With respect to Temeke municipality the following conclusions and recommendations sum up the main findings from this study:

- The main environmental changes related to climate effects observed in Temeke municipality include: changes in water availability, change in rain pattern, changes in soil aridity, changes in soil fertility, and changes in humidity. ☹ There are many cases of autonomous adaptation measures taken by residents of Temeke municipality to cope with climate change effects. Coping strategies include changes in crops grown and livestock raised and changes in house structure especially with a view to coping with flooding risks.
- Levels of awareness and general knowledge on climate change and its adaptation needs among Temeke Municipal Council staff is insufficient. As such, there is a need for capacity building in this respect.



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Annexes

Annex A: List Of People Interviewed

Annex A1: Personal Details of Staff Interviewed at Dar es Salaam City Council

S/N	Name	Gender	Age	Education Level	Department Section	Position	Experience Number of Years
1	Martha Mkupasi	Female	44	MSc UPM	Urban Planning, Environment and Transportation	Coordinator Safer Cities	
2	Grace B. Mbeni	Female	31	BSc. URP	Urban Planning, Environment and Transportation	Town planner Officer and Acting EPM coordinator	
3	Mr. Membe P. Membe	Male	56	Adv. Dip. Health and Vector Control	Waste Management	Ag. Head of Department	
4	Samwel Buberwa	Male	48	PGD Urban Waste Management	Waste Management	Ilala Municipal Waste Manager	
5	Mr. Richard K. Matari	Male	30	Dip. Environmental Health	Waste Management	Env. Health Officer	
6	Nati	Male	49	MSc. Holder	Works and Fire Rescue	Head of Department	
7	Fikiri S. Salla	Male	49	Adv. Course on Fire Safety Mgmt	Works and Fire Rescue	Chief Fire Officer	

Annex A2: Personal Details of Staff Contacted at Ilala Municipal Council

S/N	Name	Gender	Age	Education Level	Department Section	Position	Experience Number of Years
1	Kheri A Sultani	Male	31	Diploma, FTC	Works and Water Department	Hydrology Technician II	7
2	Wilfred Kavishe	Female	44	Full Technician Certificate	Works and Water Department	Water Technician	11
3	Halima Chodry Kahema	Female	48	Bachelor Degree	Works and Water Department	Senior Development Officer	6
4	Fransisca Pius	Female	39	Bachelor Degree	Lands and Urban Planning	Municipal Land Surveyor	6
5	Robin Wambura	Male	37	Masters Degree	Lands and Urban Planning	Land Officer	2.5
6	Moiston Mwakyoma	Male	37	Bachelor Degree	Lands and Urban Planning	Municipal Valuer	8
7	Samwel Buberwa	Male	48	Post graduate Diploma	Waste Management Department	Municipal Waste Manager	8
8	Cosmas Mwaitete	Male	39	Diploma	Waste Management Department	Health Officer	3
9	Charles Wambura	Male	45	Form IV	Waste Management Department	Health Officer	2
10	Abdon Mapunda	Male	38	Masters Degree	Environmental Department	Municipal Env.Mngt. Officer	9
11	Fatuma Maduhu	Female	52	Bachelor Degree	Health Department	Municipal Health Officer	13
12	Juma Nyabenda	Male	41	Bachelor Degree	Agricultural Department	Livestock Officer	9
13	Haroun M. Chacha	Male	42	Masters Degree	Drainage Engineer	Municipal Drainage Engineer	11

Annex A3: Personal Details of Staff Contacted at Kinondoni Municipal Council

S/N	Name	Gender	Age	Education Level	Department Section	Position	Experience Number of years
1	Baltary Ndombai	Male	53	Form IV	Agriculture Livestock	Livestock Specialist	15
2	Ezra Mabiki	Male	52	MA. Demography and Applied Statistics	Agriculture Livestock	Principal Agricultural Training Officer I	16
3	Kebelezo Mpitabakana	Female	48	MBA. Agro Business	Agriculture Livestock	Agricultural Officer (marketing)	12
4	Fredrick Ndibalika	Male	57	B.Sc. Botany and Zoology	Natural Resources and Tourism	Principal Forest Officer	13
5	Bupe Mwansasu	Female	39	Advanced Diploma Sociology	Natural Resources and Tourism	Community Development Coordinator	10
6	Idda Mballa	Female	45	STD VII	Natural Resources and Tourism	Bee keeping Officer II	11
7	A. J. Kagaruki	Female	52	M.Sc. Sociology and Social works	Community Development	Community Development Officer	23
8	Kawa Kafuru	Male	27	B.Sc. Environmental. Health	DMO Office	Environmental Health Officer	5 months
9	Nuru Tedy	Female	50	M.Sc. Regional Planning	Lands and Urban Planning	Head of Urban Development section	7
10	Maggy Alban	Male	32	B.Sc. Environmental. Health	DMO Office	Environmental Health Officer	5
11	Mary Komba	Female	45	M.Sc. Environmental Planning	Lands and Urban Planning	Environmental Planning Officer	15
12	Gonsalves R. Rutakyamirwa	Male	48	M.Sc. Environmental and Water Resources Management	Works and Water Department	Municipal Water Engineer	11
13	Francis Mugisha	Male	38	MSc. Environmental Engineering.		Water Engineer	9
14	Ngowi J.	Male			Works and Water Department	Municipal Land Officer	

Annex A4: Personal Details of Staff Contacted at Temeke Municipal Council

S/N	Name	Gender	Age	Education Level	Department Section	Position	Experience Number of years
1	Jumanne A. Mhogo	Male	51	Secondary	Health Department	Health Officer	
2	Ramla A. Mwasha	Male	28	BSc.LMV	Lands and Urban Planning	Land Office	
3	Salum A. Urembo	Male	33	Secondary	Lands and Urban Planning	Land Surveyor	
4	Dr. Mathis A. Lyaruu	Male	49	Masters	Health Department	Programme Coordinate	
5	Mary Mgaya	Female	58	Secondary	Health Department	Mental Health Coordinator	
6	Rwegasira D. Kayemamu	Male	49	Adv.Dip URP PGD Housing	Lands and Urban Planning	Urban Planning Officer	
7	Cosmas Kimati	Male	49	BSc.Zoology	Agriculture Livestock	Agriculture Livestock	
8	Primy Damas	Male	33	BSc. Civil & Water Resources Eng.	Works and Water Department	Municipal Water Engineer	
9	Robert J. Chenge	Male	36	FTC Water Resources	Works and Water Department	Senior Technician	
10	Teddy P. Chuwa	Female	48	B.Sc. Environmental.	Natural Resources and Tourism	Fisheries Officer	
11	Mtumbalia Said Seif	Male	48	BSc. In Animal Sc.& Production	Agriculture Livestock	Livestock Officer (Head)	
12	Mamuya E.H	Male	55	EA Dip. In Heath Science	Waste Management Department	Principal Health Officer- Waste Management	
13	Jeseoph M. Mlungwana	Male	38	Master Level	Agriculture Livestock	District Extension Officer	
14	Helbert A Mwoleka	Male	40	University Level	Lands and Urban Planning	Valuer I	

Questionnaire Form Sample

ADAPTING TO CLIMATE CHANGE IN COASTAL DAR ES SALAAM - OFFICER SURVEY ¹ (Activity 1.2)

TARGET GROUP

Staff of services already involved in climate issues (e.g. Environment, Urban Planning, Waste Management and Sanitation). Interviews to DCC officers, Municipal officers, Ministry officers according to their institutional position and willingness to participate, in order to assess existing initiatives at DCC and municipal levels.

AIM

To investigate current activities to prevent, cope with or recover from climate effects

OUTPUTS

- current ways of addressing CC issues at DCC and municipal levels
- strengths, weaknesses, gaps and possibilities for development of existing methods

*PERI-URBAN (PU) areas are areas with prevalence of low-medium density settlements and where people livelihood is partly or totally dependent on direct access to natural resources. In PU areas urban and rural activities are juxtaposed, and rural and the urban landscape features are highly intertwined.

**AUTONOMOUS ADAPTATION: Individual or collective actions, initiatives or strategies spontaneously and independently undertaken to adjust to actual or expected environmental changes. It includes all the initiatives not planned or promoted by institutions.

GUIDING QUESTIONS

Personal data (maelezo binafsi)

name (Jina)	
gender (Jinsia)	
age (umri)	
job (institution and position) (kazi-cheo)	
education (elimu)	
contact (mawasiliano)	
place (mahali)	
date (tarehe)	

QUESTIONS

- Q1. HOW LONG HAVE YOU BEEN WORKING HERE? (Umfanya kazi hapa kwa muda gani?)
(Years)
- Q2. WHAT ARE YOUR COMPETENCES AND RESPONSIBILITY? (Kwa uzoefu ulionao, eleza majukumu yako na uhusiano kati ya wilaya na mitaa/vitongoji)
- a. Physical boundaries (mipaka)
 - b. Natural resources management (usimamizi wa rasilimali)
 - c. Land use planning (mpango wa matumizi bora ya ardhi)
 - d. Development planning (mpango wa maendeleo)
 - e. Other (mengineyo)
- Q3. DESCRIBE THE MAIN RELATIONSHIP BETWEEN YOUR INSTITUTIONS AND THE OTHER INSTITUTIONS (higher-level and lower-level; eg. with District and Subwards, Ministries). WHAT ARE THEIR COMPETENCES?
- Q4. COULD YOU DESCRIBE ANY STRATEGY AND/OR PROGRAMME OR PLAN YOU KNOW (OR ARE YOU WORKING ON) IN THE FOLLOWING SECTORS IN PERI-URBAN AREAS*?
- a. Environmental risk management (usimamizi wa hatari za mazingira)
 - b. Sustainable natural resources management (water, soil, ...) (mikakati katika usimamizi wa rasilimali mfano maji na udongo)
 - c. Land-use planning (mpango wa matumizi bora ya ardhi)
 - d. Facilities supply (utoaji huduma za jamii)
 - e. Urban and/or rural development (maendeleo ya mjini na vijijini)
 - f. Other (nyinginezo)
- Q5. ARE THERE SPECIFIC POLICIES AND STRATEGIES FOR PERI-URBAN AREAS? WHAT? ARE THERE EXAMPLES OF PLANNING IN PU AREAS?
(Je mabadiliko ya maeneo ya nje ya mji yanazingatiwa wakati wa mipango? Mnazo sera na mikakati mahususi kwa maeneo ya nje ya mji? Ni zipi? Kuna mifano ya mpango wowote katika maeneo ya nje ya mji?)
- Q6. WHERE DO THE FINANCIAL RESOURCES FOR THE PROJECTS IMPLEMENTATION OF COME FROM?
- Q7. HOW DO YOU CONSIDER THE FACILITIES SUPPLY SYSTEM IN PU AREAS?
(Vipi kuhusu utolewaji wa huduma za jamii katika maeneo ya nje ya mji?)
- a. Transport system (mfumo wa usafiri)
 - b. Electricity (umeme)
 - c. Water (maji)
 - d. Waste management (usimamizi na uzoaji taka)
 - e. Education (elimu)
 - f. Health (afya)
 - g. Other (nyinginezo)

-
- Q8. HAVE YOU NOTICED CHANGES IN PU AREAS IN THE LAST YEARS? IF YES WHAT?
(Kuna mabadiliko yoyote yameonekana katika maendeleo ya maeneo ya nje ya mji kwa miaka ya nyuma?)
- Q9. IN YOUR OPINION, WHAT ARE THE MAIN LINKAGES INTERDEPENDENCIES BETWEEN PU AREAS AND CITY CENTRE AND BETWEEN PU AREAS AND RURAL AREAS? ARE THESE RELATIONS CHANGED IN THE LAST PERIOD? IF YES, WHY? (Kwa maoni yako binafsi, kuna uhusiano gani kati ya maeneo ya nje ya mji na mjini/vijijini? kuna mabadiliko kwenye haya mahusiano ukilinganisha na miaka iliyopita?)
(eg Flows of goods, resources (upatikanaji wa bidhaa); People (watu); job oppotrunities; etc)
- Q10. DO YOU KNOW ANY INFORMAL OR FORMAL NETWORK, GROUP OF PEOPLE, ORGANIZATION, RELATIONS OF TRUST AND MUTUAL SUPPORT OPERATING IN PU AREAS? WHAT THEY DO AND HOW YOUR INSTITUTION INTERACT WITH THEM?
(Are they involved in any decision making process?)
- Q11. HAVE YOU NOTICED CHANGES IN ENVIRONMENTAL CONDITIONS IN THE LAST YEARS? IF YES, IN WHICH OF THE FOLLOWING SECTOR? (Kuna mabadiliko yoyote ya kimazingira umeyaona katika kipindi cha miaka iliyopita?)
- a. Water availability (upatikanaji wa maji)
 - b. Soil fertility (rutuba kwenye udongo)
 - c. Soil aridity (ukavu kwenye udongo)
 - d. Humidity (unyeuvunyevu kwenye hewa)
 - e. Rain pattern (mzunguko wa mvua)
 - f. Other (mengineti)
- Q12. HAVE YOU EVALUATED THE IMPACT OF THOSE CHANGES IN PU AREAS?
(Kuna tathmini yoyote imefanyika kuhusu madhara ya mabadiliko ya kimazingira katika maeneo ya nje ya mji?) IF YES, HOW?
- Q13. IS YOU INSTITUTIONS IMPLEMENTING (OR IMPLEMENTED) SOME STRATEGIES TO COPE WITH ENVIRONMENTAL CHANGES AND TO REDUCE PEOPLE VULNERABILITY?
(Kuna utekelezaji wa mikakati yoyote ili kukabiliana na hayo mabadiliko na pia kupunguza uwezekano wa kuathirika zaidi kwa maeneo ya nje ya mji?)
- Q14. HAVE YOU OBSERVED THE AUTONOMOUS ADAPTATION** ACTIONS TO THESE CHANGES? FOR EXAMPLE, HAVE YOU NOTICED CHANGES IN PU ACTIVITIES DUE TO THE ENVIRONMENTAL CHANGES (Umeshaona namna yoyote ya asili katika kukabiliana na hayo mabadiliko? Mfano mabadiliko ya shughuli za maeneo ya nje ya mji)
- a. Change in crop system (mabadiliko ya mfumo wa mazao)
 - b. Change in livestock (mabadiliko katika ufugaji)
 - c. Change on house structure (mabadiliko katika ujenzi wa nyumba)
 - d. Other

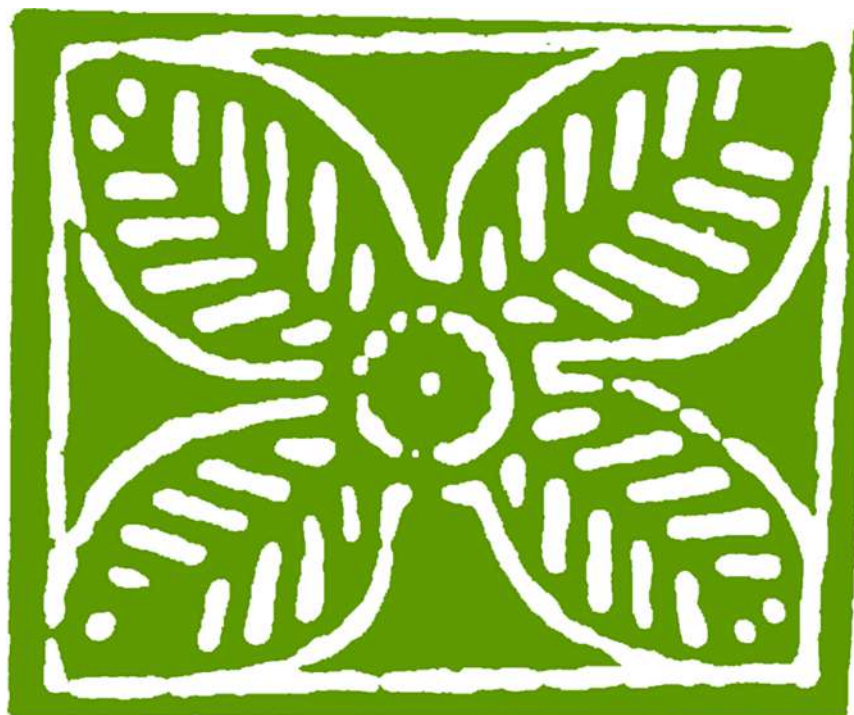
Q15. DO YOU HAVE ANY INFORMATION OR BASELINE STUDY ON PU ENVIRONMENT, DWELLERS AND LIVELIHOODS? (Mna takwimu au tafiti zozote kuhusu watu na maisha katika maeneo ya nje ya mji). IF YES WHAT?

- a. Employment (ajira)
- b. Population (idadi ya watu)
- c. Type and house dimension (aina na ukubwa wa nyumba)
- d. Other (nyinginezo)

Q16. WHAT ARE THE REASONS OF THE ENVIRONMENTAL CHANGE? (Nini sababu hasa ya haya matatizo ya kimazingira?)

- a. Climatic variation (mabadiliko ya tabia ya nchi)
- b. Human land use (Matumizi ya ardhi)-
- c. Inadequate environmental management (mapungufu katika usimamizi wa mazingira)
- d. Other (nyinginezo)

¹The Questionnaire has been designed by Liana Ricci with the support of Chacha Nyamboge for the Swahili translation



Project title:

Adapting to Climate Change in Coastal Dar es Salaam

Project acronym:	ACC Dar
Contract number:	2010/254-773
Project duration:	01/02/2011 – 31/01/2014
Grant Contract Beneficiary:	DICEA Sapienza University of Rome
Contact Person:	Silvia Macchi
Partner in the Action:	Ardhi University Dar es Salaam
Associate in the Action:	Dar es Salaam City Council