ASSESSMENT OF PRACTICES THAT URBAN DWELLERS DO FOR ENVIRONMENTAL MANAGEMENT IN KINONDONI MUNICIPALITY

BY

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A DISSERTATION SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF SCIENCE IN MANAGEMENT OF NATURAL RESOURCES FOR SUSTAINABLE AGRICULTURE OF SOKOINE UNIVERSITY OF AGRICULTURE. MOROGORO, TANZANIA.

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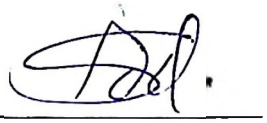
ABSTRACT

This study was conducted in Kinondoni Municipal Council in Dar es Salaam region, Tanzania. The main objective of the study was to investigate the environmental management practices of the urban dwellers in their residential areas. A simple random sampling procedure was employed to obtain a sample of 85 households from two divisions namely: Kinondoni and Magomeni. Data were collected through personal observations, administration of structured questionnaire and key informant interview. The collected data were coded and analysed using the Statistical Package for Social Sciences (SPSS) computer program. Both quantitative and qualitative methods of data analysis were employed. It was revealed that about 93% of the residents in Kinondoni Municipality involved in environmental management practices. The linear regression results showed that domestic waste collection practice and cleaning the surroundings were statistically significance ($p<0.05$). This implies that these were the major environmental management practices of the urban dwellers in their residential areas. The study also found out that social, economical, political and cultural factors such as among others income levels, education levels, municipal guidelines, bylaws, and plot sizes influenced urban dwellers' participation in residential environmental management activities. The study concludes that majority of the residents participated differently in residential environmental management activities due to differences in their socio-economic, cultural and political orientations. The study recommends that the central government through local government authorities should lay down proper policy mechanisms for promoting dwellers' participation in environmental management at the residential areas. In addition, municipal authorities should ensure that urban dwellers in residential areas are provided with supporting environmental management infrastructures such as tap water and better drainage systems, which will enable them to participate fully in the environmental management activities.

DECLARATION

I, Sunday David Iddi, do hereby declare to the SENATE of Sokoine University of Agriculture that this Dissertation is my own original work and has never been submitted nor concurrently being submitted for any degree award in any other institution.



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DEDICATION

I dedicate this dissertation to my beloved parents Jacob Iddi and Anna Iddi who laid down the foundation of my education. May Almighty God rest their souls in eternal peace.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

LIST OF ABBREVIATIONS

DAWASCO	-	Dar es Salaam Water Supply Company
DCC	-	Dar es salaam City Council
FAO	-	Food and Agriculture Organization
IUCN	-	International Union Conservation of Nature
JICA	-	Japanese International Cooperation Agency
KMC	-	Kinondoni Municipal Council
LEAT	-	Lawyers Environmental Action Team
MNRT	-	Ministry of Natural Resources and Tourism
NCSSD	-	National Conservation Strategy for Sustainable Development
NEMC	-	National Environmental Management Council
NGO	-	Non Governmental Organization
PANA	-	Pan African News Agency
SNAL	-	Sokoine National Agricultural Library
SPSS	-	Statistical Package for Social Sciences Programme
TANESCO	-	Tanzania Electricity Supplying Company
TV	-	Television
UDSM	-	University College of Dar es Salaam
UNCED	-	United Nations Conference on Environment Development
URT	-	United Republic of Tanzania

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background Information

The term environment refers to a complex of surrounding circumstances, conditions, or influences in which a thing is situated or is developed. The environment in its broadest sense comprises all living things (biotic components such as fauna, flora) and non-living things (a biotic things such as land, water, climate, atmosphere), and all the social factors, which make the quality of human being's living (IUCN, 1980).

The management of the urban environment involve measures, that is, political, economical and socio-cultural that are designed to manage air, water, land, and soil resources to maintain their qualities and quantities at the level that are not harmful to public health (IUCN, 1980). Human activities that can positively influence the quality of environment include tree planting, gardening, domestic waste collections, agro-forestry, cleaning the surrounding, sustainable urban agriculture to mention just a few. These environmental activities contribute positively to the sustenance of the biological component of the city environment making such environments more pleasant, safe and valued by their inhabitants (Jorge *et al.*, 1995). These activities were part of several government initiatives in conserving the environment through the formulation of bylaws which prohibit people from degrading the environment especially in the protected areas such as national parks, coastal areas, forest reserve and open spaces left for sports and games and other developmental activities. In relation to this, Dar es Salaam City Council enacted several by-laws regarding planting, maintenance and protection of trees, domestic waste collections, cleaning surrounding and animal domestication in urban areas in order to protect the urban environment. However, despite these efforts in conserving the urban

environment there is a continuation of some human activities which negatively affect the quality of the urban environment such human activities include water, land, air, and noise pollution, over grazing, frequent cutting trees and the use of chemicals in agricultural activities. According to Mvena *et al.* (1991), a result of urban agriculture, livestock keeping, industrial and other activities, pollution has become a social and environmental issue in many urban areas in Tanzania.

Urban municipal authorities are playing an important role in financing, planning and provision of waste collection and disposal services for her citizens in order to meet the multiple goals. Such goals include provision of healthy living and working environments for inhabitants, water supply, provision for sanitation and garbage disposal, construction of drainage and other forms of infrastructure and services essential for health. Also, through local government leaders urban municipal authorities encourage urban dwellers to participate in the management of their residential environment. Despite the extensive support from municipal authorities in enhancing quality in the urban environment, differences in residential area set-up among urban dwellers, that is having low, medium and high- density areas cause a variation in the quality of residential environment in urban areas.

High density residential areas in Kinondoni Municipal Council are faced with poor quality environment, which keep on deteriorating due to population pressure, poor settlement planning, lack of environmental supporting infrastructure, and inappropriate urban environmental management policies. Others include small plot size (below 600 m^2) and lack of tap water (KMC, 2004). Most of the high-density areas in KMC are lagging behind in several environmental management activities such as tree planting, domestic waste collections, gardening, and cleaning of the surrounding areas. Furthermore, tree

planting practice in KMC residential areas is constrained by inhospitable climatic conditions, destruction by roaming livestock, presence of termites, aphids, and fungus, destruction of trees by motor vehicles, haphazard trees cutting by TANESCO staff, especially in the main gridlines, water shortage and lack of people's awareness of the guidelines and bylaws that govern trees planting (Madadi, 2005).

1.2 Problem Statement and Justification

Urban environmental management, particularly in residential areas experience many constraints because of complex political and social situations that prevail in the area concerned. The underdevelopment nature of developing countries has fuelled the problem of urban environmental management in developing countries. Local governments' performance in developing countries have not been successful in the management of the environment, as they face constant problems in various operations (LEAT, 2008).

The relaxation of KMC bylaws, guideline, and regulations on environmental management is a threat to urban development and jeopardizes the current millennium development goal on environmental conservation, particularly in residential area. Being one of the growing municipals in Dar es Salaam region. KMC faces many environmental problems partly due to over population and improper urban environmental management policies.

Most of KMC residential areas are extremely vulnerable to the persisting uncontrolled human activities, unplanned settlements, and uneven distribution of environmental support infrastructures such clean water supply, and drainage systems. There is also a variation in the quality of the environment reflected in the residential set-up in terms of whether the area belongs to a low, medium, or high density. In high- density areas for example there is poor domestic waste management, several informal landfills nearby houses, water logging

nearby houses, drainage systems and unplanned settlements all these things contribute to lowering the quality of the environment in these areas. However, the situation is a little better in medium and low-density areas where people manage the surrounding environment better due to the availability of space and adequate infrastructural support. Furthermore, the existing socio-economic, political and cultural factors appear to influence the environmental management practices in residential areas.

Despite the fact that much has been known on the environmental practices in KMC, less has been done on assessing the practices that the residents do for the environmental management. Therefore, understanding of socio-economic, political, and cultural factors in environment management practices will contribute to enhancing residential environmental management. This too will serve as basis for suggesting strategies that policy makers can use in restructuring the urban environment particularly in the residential areas of Kinondoni Municipal Council (KMC).

1.3 Objectives

1.3.1 General objective

The general objective of this study was to investigate practices done by urban dwellers in managing the environment in the residential areas of Kinondoni Municipal Council (KMC).

1.3.2 Specific objectives

The specific objectives were:

1. To identify the environmental management practices of urban dwellers in the residential areas;

2. To assess urban dwellers attitudes and knowledge towards environmental management practices in residential areas;
3. To examine the variations in environmental management practices among urban dwellers in residential areas; and
4. To assess the influence of socio-economic, political and cultural factors on environmental management practices in residential areas.

1.3. The research questions

The study were guided by the following research questions:

1. What are the environmental management practices of urban dwellers in residential areas?;
2. What are the influences of socio-economic, cultural and political factors in residential environmental management practices?;
3. Are there any variations in environmental management practices among urban dwellers in different residential areas?; and
4. How do urban dwellers perceive the environmental management practices?

1.3.4 Limitation of the study

A number of respondents were unwilling to spend their time being interviewed as they were occupied by other income generating activities. This problem was solved by the assistance of experienced division officers who talked to the respondents about the importance of the study and how having a pleasant environment could be of benefit to them. Also, there was a problem of keeping records among the respondents especially on data related to household income, and income that household generated from other sources, and the duration that households spent in the area. Furthermore, some areas were not easily accessible due to being water logged especially in the streets of Msasani Bonde

la Mpunga, and Mhalitani. These problems had resulted to a sample size of the study instead of being at least 5%, the sample size was 0.8%. However, the situation did not affect the findings of the study.

1.3.5 Conceptual framework

The conceptual framework for this study (Fig.1) indicates the association between the socio-economic, political, and cultural factors and the way they affected environmental management practices such as gardening, cleaning surrounding, domestic waste collection, urban agriculture and tree planting as carried out by urban dwellers in residential area of KMC.

In this study, urban environmental management practices such as tree planting; urban agriculture, domestic waste collection, gardening, cleaning the surroundings, and cutting grasses were considered to be influenced by socio-economic, political, and cultural factors of Tanzania. The interaction between the two could result into a pleasant urban environment, if socio-economic incentives motivate positively sustainable urban environment will be attained, but on the contrary socio-economic dis-incentives will discourage the urban community from participating fully in conservation leading to poor urban environment.

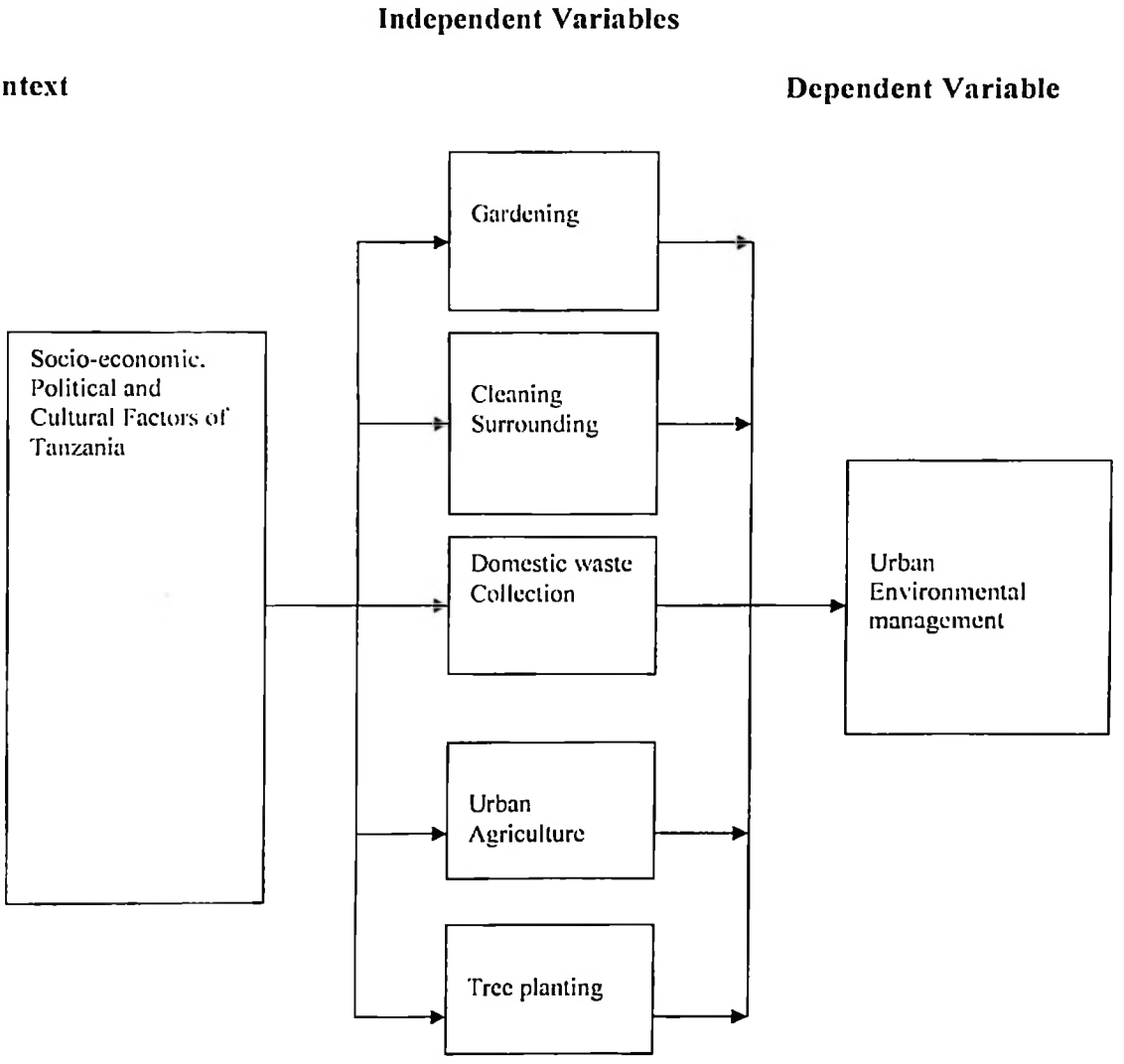

Figure 1: Factors affecting urban dwellers' participation in environmental Management practices in residential areas in KMC.

From Fig. 1, it is observed that social-economic, political, and cultural factors shape the context in which environmental management practices (independent variables) occur. Each of these factors are explained below.

(i) Socio-economical factors

Social factors are those factors which relate to the human life, for instance, education level, culture, marital status, age, gender to mention just a few.

Katani (1999) defines economic factors are those related to the financial status, which include purchasing power and labour costs. In this study, economic factors involved financial earnings both from formal and informal employment, from other income generating activities such as operating kiosks, transportation business, retail shops, food vending, charcoal selling, operating bars, etc, and home assets that are owned by a respondent.

This study assumed that the respondents with good economic well-being would implement more environmental management practices in residential areas than would have been the case with those with little incomes. Katani (1999) argues, people with higher income usually have more resources including land, and may consequently plant more trees to help secure biodiversity than would have been the case with people with low income.

(ii) Political factors

Political factors refer to all policies, bylaws and guidelines that are designed to monitor people's daily activities in relation to the management of the environment in the residential area. Municipality assumed the responsibility of creating public participation in strategic planning, budgeting and auditing, and reporting decision making processes, among others. The study assumed that effective municipal policies, bylaws and guidelines promote environmental management practices of urban dwellers in residential areas.

(iii) Cultural factors

According to Ufunguo (2002), cultural factors are ways, which contribute to change in value systems, individual behaviour, family relationships, collective life styles, safety levels, moral conducts, creative expression, traditional ceremonies, and community organization. In this study, cultural factors included religions of the respondents, places of birth and places of origin. This study assumed that variations in cultural backgrounds and perceptions of the respondents have an effect on environmental management practices of urban dwellers. For instance, in tree planting, Kilahama (1991) concluded that experience from other parts of Tanzania show that some people may grow trees because of their social derives since some ornamental trees species may be required to make homes attractive.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Global Overview of Urban Environmental Management

Environmental effects due to urbanization have been observed since in the early 18th century. Until the middle of the 20th century, urbanization was too low and the number of large cities was too small for any significant effects other than local climatic and hydrological impacts. Cities and towns in most countries around the world have been gaining considerable attention due to the large number of people migrating to cities and its consequent effects (Turner *et al.*, 1990). People's migration is fuelled by the centrality of goods and services that cities offer

However, with massive rural-urban migrations caused by differences in per capital income between cities and towns, many cities experience over-population problems due to inadequate resources and services to sustain the population. This trend results into many environmental related problems such as air and water pollution, waste generation, garbage, sewage disposal, congestion, due to urban processes like manufacture, transportation, construction, migration, population growth, residence/living, and community services delivery(Turner *et al.*, 1990).

Due to the above-mentioned short falls, the 1992 United Nations Conference on Environment Development (UNCED) summit called for global environmental management and sustainable development in both rural and urban areas. This stimulated the demand for urban environmental management improvement strategies through institutional strengthening, including the issues of low willingness to pay for environmental management services, weak institutional and technical capability, lack of

supportive policy and legal frameworks, and the need to create a conducive setting for private sector financing, demonstration of the benefits of urban environmental improvement by pilot projects, strengthening of municipal financial capacity for environmental improvements, increased resource utilization as a project objective for example, the incorporation of a sewage treatment project within the overall water quality management framework,' campaigns to heighten public awareness of environmental issues,' and promotion of regional cooperation (Andrew, 1994). All these efforts had to overcome various setbacks related to differences in socio-economic well being among urban dwellers as well as urban settlements division that draw a demarcation between the haves and have nots.

2.2 Urban Environmental Management in Tanzania

In Tanzania, efforts in environmental conservation existed before the introduction of the colonial rules whereby societies had a system of governance that protected community resources such as forest, sources of water. As Chamberlain *et al.* (1998) pointed out that tribal rules and regulations foresaw allocation and utilization of resources. Examples of such rules include those, which enhance productivity or protection of trees and shrubs against abusive harvesting and browsing. Furthermore, Kikula and Mwalyosi (1994) observed that, priorities for biodiversity conservation projects in Tanzania under colonial and even after independence were characterized by marginalization of the local people who had the stake of the existing biological resources.

During post independent era, Tanzania enacted several institutions, laws and by-laws to control the overexploitation of natural resources. In 1983, the government formed the National Environmental Management Council (NEMC) whose aims were to ensure the survival of natural resources both terrestrial and aquatic natural resources. This governing

board was assisted by some government ministries, parastatals and some NGOs in various aspects related to environmental management.

In 1990, the Ministry of Natural Resources and Tourism was inaugurated to oversee environmental issues. Despite the introduction of several environmental management by-laws under the supervision of the Ministry and NEMC differences in per capital income between rural and urban areas fuelled the unlawful utilization of the available resources. For instance, in putting maximum efforts in encouraging people to participate in managing the environment the government of Tanzania launched a national tree planting campaign on first of December of every year. Although there is a long list of Acts geared at safeguarding the environment, these do lack follow-up and effectiveness, which is typical of many by-laws and laws of Tanzania. All along, there has been a problem of co-ordination of conservation and management issues (Bagachwa *et al.*, 1995).

From the above mentioned shortfalls, in 1994 NEMC advocated the formation of the National Conservation Strategy for Sustainable Development (NCSSD). With the introduction of NCSSD about six major environmental problems that required urgent attention were identified, namely (1) loss of wildlife habitats and biodiversity; (2) deforestation; (3) land degradation; (4) deterioration of aquatic systems; (5) lack of accessible, good quality water; and (6) environmental pollution. The government of Tanzania, through NEMC and NCSSD, has formulated a number of policies, enacted pieces of legislation-principal and subsidiary and established various institutions to facilitate and carry out its duty to protect and manage the country's environment (NEMC, 1994).

With decentralization policy, local government authorities became the main actors in implementing all the environmental management strategies in managing and protecting the environment in their respective areas of jurisdictions which include village councils, district councils, townships and municipal authorities.

There have been some notable efforts by town and municipal councils, in collaboration with environmental management NGOs and communities, in environmental management through tree planting, domestic waste collections, sustainable urban agriculture, gardening, cutting grasses etc. Environmental management campaigns on these activities were conducted to meet the multiple goals of sustainable development, particularly in public as well as residential areas of urban townships and municipalities.

However, these environmental management efforts by towns and municipal councils are constrained by poor infrastructure facilities e.g. clean water and drainage systems, financial constrains, shortage of personnel and poor planning all of which are a threat to urban environment. For instance, there are forms of water and air pollution and the unhygienic disposal of solid waste resulting from high density populations and unplanned areas with poor waste-water and solid waste management systems (Kishimba and Mkenda, 1995). Lack of success in these efforts has partly been due to having weak or lack of enforcement for most of the by- laws and regulations because of institutional weaknesses and lack of financial support.

Participation is generally referred to as a process whereby individuals and families assume a responsibility for their own health and welfare and for the health and welfare of the community and develop the capacity to contribute to their own and the community's development. In KMC the participation of urban dwellers in the implementation of urban

environmental management practices in their residential areas is subjected to socio-economic factors.

Like many municipalities, urban dwellers in KMC participate in tree planting in their residential areas for improving the environment as well as the quality of life. It has been observed that many trees were planted in towns for various purposes including improving the landscape amenity; improve the appearance of buildings, to diversify wild life habitats, to provide shelter in open areas, to stabilize easily eroded soils and spoil tips, and to produce timber and wood for sale (Douglas, 1982). In this respect, have been planted in urban areas (see Appendix 3). Local authorities and divisions have been given the role of ensuring that every dweller in his or her residence participated in planting and maintaining trees in accordance with the National Tree Planting Campaign.

Through these concrete government efforts, many tree species were planted in business places, residential areas, along the main and minor roads, open spaces, schools, university premises, recreational premises and government offices. However, as we have seen earlier in the urban areas this practice is faced with a lot of difficulties due to poor support infrastructure such as availability of water, power and communication lines, limited plot sizes, animal disturbances, high price for tree seedling, insufficient municipal guidance and bylaws in assisting urban dwellers participation in tree planting practice. FAO (1999) reported that in developing countries, most of the planted trees in urban areas perish, or survive with difficulties, or become hazardous to social infrastructures and structures before growing to desired maturity due to various reasons.

In principle waste management in Tanzania, is the responsibility of the local authority. The local Government (Urban Authorities) Act of 1982 assigns urban authorities with the

responsibility of removing refuse and filth from any public or private place and to provide and maintain public refuse containers for temporary deposit and collection of rubbish (KMC, 2004). According to JICA (1997), KMC is estimated to generate about 2 206 tones of waste per day from residential areas, industrial areas, institutions, commercial establishments like, markets and other informal sectors (Table 1).

Table 1: Amounts of solid generated in KMC

Serial no.	Type of waste	Tones generated per day
1	Household waste	1762.0
2	Commercial waste	33.1
3	Institutional waste	13.2
4	Market waste	44.1
5	Street waste	2.2
6	Informal sector waste	350.8
Total		**2206**

Source: KMC Profile, 2004

However, although KMC plays an important role in financing, planning, and providing waste collection and disposal services there are still many drawbacks to the daily execution of this exercise such as shortages of working equipment like special vehicles for collecting wastes, poor infrastructure networks between the main roads and feeders roads and unplanned settlements.

2.2.1 Urban gardening

Ferris and Sempik (2001) define urban gardening as the practice of growing plants for their attractive flowers or foliage or using these plants to beautify the local environmental conditions. Urban gardening can be practised on the land near a residence, or on a roof, in an atrium, on a balcony, in a window box, or in containers like pots, hanging baskets, and

planters grown inside or outside. Furthermore, urban gardening range from fruit orchards, to long boulevards plantings with one or more different types of shrubs, trees and herbaceous plants in residential yards. Gardening may often be very specific, with only one type of plant grown, or a large number of different plants in mixed plantings. It involves an active participation in the growing of plants and tends to be labour intensive, which differentiates it from farming or forestry (Dweyer, 2001).

In the study area, gardening is done on a smaller scale, primarily for pleasure and for producing goods for the gardener's own family or community consumption. In high-density areas of Mhalitani, Sinza E, Msasani Bonde la Mpunga due to space constrains, and water scarcity few households participated in gardening through planting flowers only in containers outside houses. In low- density areas of Sinza A, Mpakani, and Oysterbay, many households practice gardening mainly in residential yards, in an atrium, on a balcony, and in containers. This is possible due to the availability of tap water, availability of space, and owners' sustainable income levels in financing gardening activities.

2.2.2 Urban agriculture

Fraser and Evans (2000) define Urban agriculture as an integrated farming practice of cultivating, processing and distributing food in or around peri-urban, a village, town or city. Urban agriculture is practiced for income-earning or food-producing purposes though in some communities the main impetus is recreation and relaxation. Urban agriculture contributes to food security and food safety in two major ways: first, it increases the amount of food available to people living in the cities, and secondly, it allows fresh vegetables and fruits and meat products to be made available to urban consumers.

With rural-urban migration processes, urban agriculture practice in KMC has encountered several problems particularly in high density areas like Msasani Bonde la Mpunga, Mhalitani, and Sinza E. As we have seen, due to limited space, and water scarcity urban dwellers in these areas use poor agricultural practices for example in animal domestication they use free range systems for domesticating their animals leading to environmental degradation in residential areas. Mlozi (1995), found out that livestock keeping in most towns and cities destroy ornamental plants as animals search for food and eat grass around people's homes, along the roads, and in open spaces making these areas bare and pre disposed to soil erosion.

Furthermore, due to limited space and scarcity of water in these highly populated areas little efforts were made to conserve the environment. Few households grew vegetables like amarunthus and spinach for domestic use only. However, in order for these households to meet their daily needs of food as well as income, some household members go to other places such as along the valleys, and open spaces for gardening. In these areas they raise fresh vegetables under deplorable conditions which are prone to affecting consumers' health as they use waste water for irrigation without careful treatment and monitoring, such practices could result into the spread of diseases among the population and contaminating the cultivated land.

There were however some encouraging prospects in the environmental conservation efforts in low density areas like Oysterbay, Sinza A, and Mpakani B, whereby majority of respondents have opted for zero grazing and indoor systems of feeding their livestock such as poultry, goats, dairy cattle, pigs, etc. In addition, these areas had constant supply of water and some members were able to raise some foodstuffs like bananas, vegetables, pawpaw, on their yards.

2.2.3 Cleaning the surroundings

Clean surroundings in Tanzania are directly linked to the Local Government Act No 8 of 1982, which requires municipal authorities to enforce the practise of cleaning the surroundings in residential areas (DCC, 1989). Cleaning the surroundings involve all measures that are taken by an individual to maintain the surrounding environment homes from other toxic and unwanted materials that could jeopardize or harm human health. These activities include daily cleanness of the surrounding area, cleaning houses, and toilets. Regardless of the residential set up and the assistance from municipal healthy officers, many urban dwellers participated in cleaning the surrounding environment campaigns for their better health as well as for maintaining the pleasant surrounding environment. Due to the frequency of sporadic diseases such as cholera, and malaria in residential areas, municipal health officers made frequent visit to monitor the cleanness status, hence compelling residents to clean their surrounding environment.

2.3 Attitudes and Knowledge on Environmental Management Practices

The issue of urban dwellers' awareness of environmental management practices in the study areas was determined in terms of the respondent's ability to integrate various environmental management practices in their residential areas through their actions towards mitigating environmental damage. In this study, the education level of the respondents as playing a key role in determining people's attitudes and knowledge in environmental management practices. Kagya (2002) made similar observation that people with formal education stood a better chance of adopting new technologies for planting trees provided they have access to necessary resources. Moreover, several factors influenced urban dwellers attitudes and knowledge on environmental management practices at residential areas. These factors galvanized these people into participating in environmental management activities at the residential areas.

2.4 Variation in Environmental Management among Urban Dwellers

The variation in environmental management practices among urban dwellers came about as a result of variations in incomes, education levels, accessibility to supporting infrastructure e.g. tap water, plot size, duration of stay, and settlement status of the respondents. Management practices such as domestic waste collections, gardening, agriculture, and cutting grasses need extra capital for carrying out proper environmental management practices. Urban dwellers with higher incomes had the ability to participate effectively in various environmental management practices. This was observed to be common phenomena for the respondents of Oysterbay, Mpakani B, and Sinza A areas.

Furthermore, it was observed that in gardening practice urban dwellers with higher income were able to employ labour to deal with garden activities such as planting new flowers, pruning older ones, and planting grasses. Also, education level of the respondent played a crucial role on urban dwellers' participation in residential environmental management practices because such practices require skills and new technologies in managing residential environment in a sustainable manner. The higher the education level the higher the level of awareness and thereby creating positive attitudes, values and hence motivating people to manage natural resources sustainably (Katani, 1999).

2.5 Influence of Socio-economic, Political and Cultural Factors on Environmental Management

Human life depends on biological resources for food, energy, construction materials, medicines and related products (Mbwambo, 2000). Socio-economic, political and cultural factors such as sex, income, educational level, density status, household size, taboos, bylaws and policies, played a significant role in urban environmental management practices of urban dwellers in residential areas. Socio-economic factors at various levels of

social systems form an environment where people interact through roles and relationships defined by gender, age, ethnicity, income and other social variables (Lubwana, 1999).

Education is a tool that can make people manage the surroundings properly through the implementation of different environmental management practices. Urban dwellers who achieve higher education levels have a better chance of implementing various environmental management practices in a sustainable way as opposed to those with low education level, despite the existing shortcomings such as limited space, water scarcity, and inadequate environmental management policies.

According to Rutatora (1993), through education the community may know the rationale for taking care of their environment. The relationship between the level of education and attitude towards natural resources is pragmatic as it provides people with the necessary skills to establish and maintain investment in resources conservation (Fanuel, 2002). However, it is important to note that the adoption of skills is not perfectly correlated with years of schooling (Machumu, 1995).

Income is one of the compelling factors in attaining sustainable management of natural resources (Fanuel, 2002). Income has an economic implication as urban dwellers with enough incomes were in a better position to practice several environmental management practices in their residential areas, compared to those with low incomes. Therefore, the chances of engaging in environmental management activities in residential areas like tree planting, gardening, domestic waste collection, and urban agriculture were higher among the rich than among the poor. As Katani (1999) argues people with higher incomes usually have more of the available resources such as land and as a results they may be able to plant more trees to help biodiversity than is the case with low incomes.

Land is one of the most important determinant factors in the adoption of environmental management practices in residential areas. With enough land, people may have opportunities to participate in various environmental management practices, particularly those management practices which need enough space such as tree planting practicing, urban agriculture and gardening.

Culture influences the pattern of decision-making. Cultural rules and norms are important as part of the institutions and are essential for the society to function smoothly (Holden, 1996). Like other urban municipalities, cultural beliefs and customs have a strong influence on dwellers participation in environmental management practices at residential areas in KMC. These beliefs and customs include ritual and legal prohibitions against planting or using certain trees, regulations on where trees and food crops may be planted, restrictions on who may plant trees and certain types of food crops, and rules regarding the use of trees and their products (Emerton, 1996). Based on the complexity nature of urban areas in terms of population immigrations from various areas of the country for various reasons, it is difficult to make any generalizations about cultural norms and customs because of the cultural diversity among the people in urban residential area. They are, however, powerful determinants of people's actions and often hold more local influence than rules and legislation set by the central government (Felician, 2005).

Political factors refer to all policies, bylaws and guidelines that are designed to monitor people's daily activities in relation to the management of the environment in residential areas. There is a governing policy for environmental management in the country, but the mechanisms and plans of actions at the local level are not well articulated and implemented. There is inadequate expertise in the field of environmental education and public awareness to implement those designed policies at all levels (LEAT, 2008). In

order to ensure the effective implementation of the designed bylaws and guidelines, the central government has given the responsibility to the municipal authority to promote public participation in strategic planning, budgeting, auditing and reporting in decision-making processes on matters related to the management of environment at local levels.

2.6 By – laws in Urban Areas

The Local Government (Urban Authorities) Act No. 8, made under section 80 of 1982, gives power to local authorities to regulate all activities related to planting, maintaining and protecting trees in urban areas in Dar es salaam City. The by-laws stipulate that every resident who holds land under the right of occupancy or in accordance with customary law pertaining to land tenure shall plant trees as set out in the schedule to these by-laws. Residents in low-density and medium- density areas shall plant, maintain and protect not less than six trees while owners of surveyed plots in high density shall plant, maintain, and protect not less than two trees or such number of trees as the forest officer or parks superintendent of the council shall direct (DCC, 1989).

Act No.9, sections 6 and 13 of the 1982 bylaw applies to the Kinondoni Municipal Council. This by-law, further, stipulates that any person in actual occupation of premises or a residential dwelling in regardless of the title under, which he occupies the premises shall clean, remove all wastes and maintain cleanness of the frontage of his house to the satisfaction of the authority and shall be required to pay at the end of every month refuse collection charges as provided by the municipal authority. These by-laws, further, conclude that any person contravening these by-laws shall be guilty of an offence and shall be liable on conviction to a fine not exceeding fifty thousand shillings or for a term not exceeding six months imprisonment or both fine and imprisonment (KMC, 2004).

Local Government (Urban Authorities Act, No.8 of 1982) provides by-laws on the animals kept in city areas. These by-laws also apply to all animals kept within the city area and which include camels, cattle, donkeys, goats, horses, mules, pigs, sheep and rabbits. Section 4 of this by-law stipulates that no person shall keep any animal within the city area unless he/she shall have obtained a permit from the City Director. Section 6 of the bylaw further prohibits urban dwellers to graze any animal within the city area. These by-laws carry a penalty not less than Shs.5000 or six month imprisonment or both of the two, for any person who contravene or fail to comply with any of the provisions of the by-laws (DCC, 1989).

2.7 Summary of the Knowledge Gap

From the review of various literatures, environmental management has been given priorities based on its importance. However, some environmental management practices done by urban inhabitants, their attitudes towards the practices and socio-economic, cultural and political factors on environmental management practices in residential areas have scantly been addressed.

CHAPTER THREE

3.0 MATERIALS AND METHODS

3.1 Description of the Study Area and Geographical Location

This study was conducted in KMC urban divisions. The main reason of selecting KMC is due to the fact that it is highly populated and has many unplanned settlements where the issue of environmental management practices are appropriate. KMC is among the three municipalities within Dar es Salaam Region. The region is bordered by the Indian Ocean to the north east, Ilala Municipality to the south, Bagamoyo District to the north, Kibaha District to the west, and Kisarawe District to the south west (Fig. 2). The municipality encompasses an area of 531 km^2 covering both rural and urban areas (KMC, 2004).

KMC has four divisions namely: Magomeni, Kinondoni, Kibamba and Kawe, with 27 wards and 127 sub-wards. The study area experiences a modified type of equatorial climate, which is generally hot and humid throughout the year with an average temperature of 29 ^{0}C. The hottest season begins in October through March, while it is relatively cool in the months of May through August with temperature around 25 ^{0}C. The region has two rain seasons, short rains from October to December and long rains season from March to May with an average annual rainfall of 1300 mm. Humidity is around 96% in the mornings and 67% in the afternoons. The climate is influenced by the Southwest monsoon winds from April to October and northeast monsoon winds between November and March. The soil types are mixed but predominantly sandy.

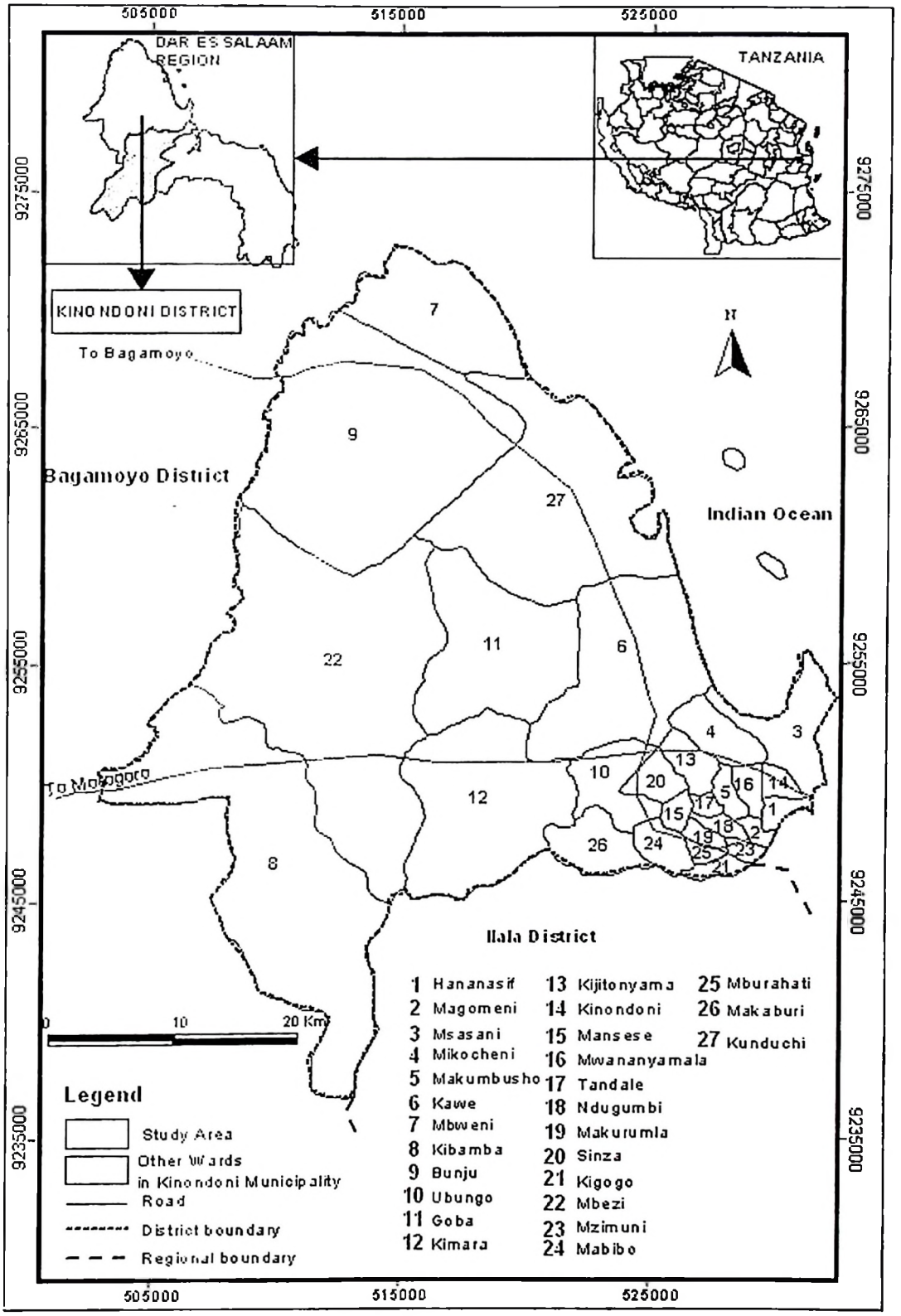

Figure 2: Map of Kinondoni Municipal Council

3.2 Socio-Economic Profile of the Study Area

KMC is the biggest and highly populated municipality in Dar es Salaam region with several political, socio-cultural and economic activities in the capital city. According to 2002 census KMC has a population of 1 088 867 people with a growth rate of 4.1% .This rapid population increase is influenced by both natural causes and a massive immigration. Due to the rapid population increase KMC is expected to have the total population of 1 501 692 by the year 2010 (URT, 2003). Like other municipalities, KMC is not well planned in terms of settlement thus many people live in squatters. This causes many problems, especially when it comes to the provision of social services e.g. clean drinking water, fire fighting services, and electricity.

It is estimated that around 360 000 residents of KMC 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 and a working force of 200 000 people is self-employed. The majority of the residents are involved in petty businesses, fisheries, livestock keeping and urban agriculture including horticulture for family food, and for the generation of extra incomes (KMC, 2004).

3.3 Research Design and Sampling Procedure

A cross-sectional research design as suggested by Casley and Kumar (1988) was employed in this study. Data were collected at one point in time from a selected sample of respondents to represent a large population. The data collected were used for both descriptive analysis and for the determination of relationship between and among the variables. A sampling unit for this study was a household. According to the World Bank (2002), a household is defined as the number of people who dwell or live under the same roof and share the same bowl. This design was considered suitable due to time limit for data collection.

The multistage sampling technique and stratified sampling were used to stratify urban dwellers based on the existing sub divisions of low-density and high-density of KMC. Two divisions namely Kinondoni and Magomeni were purposively selected. Six types of settlements were randomly selected. A total sample size of 85 households, 44 from Magomeni and 41 from Kinondoni were selected randomly using a table of random numbers (Table 2). Interviews involved 0.8 percent of randomly picked households from the study divisions with a total number of 10 841 houses, 5132 houses for Kinondoni, and 5609 for Magomeni. According to Bailey (1994), a sample of 30 respondents is the bare minimum for studies in which statistical data analysis is to be done regardless of the population size. It is therefore, the selected sample is statically accepted in drawing significant conclusion.

Table 2: Multistage sampling results obtained from the study area

Municipal	Division	Ward	Street	Density planning	Number of respondents
Kinondoni	Kinondoni	Kijitonyama	Mpakani B	Low density	13
		Msasani	Bonde la mpunga	High density	18
			Oysterbay	Low density	10
	Magomeni	Sinza	Sinza A	Low density	20
			Sinza E	High density	9
		Tandale	Mhalitani	High density	15
Total					**85**

3.4 Data Collection

Both primary and secondary data on socio-economic, political, and cultural components of respondents were gathered in this study.

3.4.1 Primary data

(i) Participant observation

According to Kajembe (1998), participant observation method is distinguished from other methods because the observer becomes part of the situation being studied. This method was used by the researcher in order to gain more understanding on the way urban dwellers participated in residential environmental management practices through tree planting, domestic waste collections, urban agriculture, gardening, cleaning the surroundings, and other management practices, and the way these activities related to socio-economic, political, and cultural factors. In addition, direct observations enabled the researcher to tie together discrete elements and information collected by other research instruments such as questionnaires and interview.

(ii) Key informants' interview

According to Katani (1999), a key informant is an individual who is accessible, willing to talk and has a great depth of knowledge about the issues in question. Information from key informants such as municipal environmental management officials, local government leaders, and private environmental management association NGO's was collected gathered for this study. The discussions with key informants focused on the way urban dwellers participate in residential environmental management activities, and the contribution from municipal authority and other environmental management stakeholders in maintaining the residential environment. A checklist for key informants is shown in Appendix 2.

(iii) Questionnaire

A structured questionnaire with closed and open ended questions was used for data collection. The questionnaire was prepared in English and later translated in Kiswahili for effective communication with the respondents. The questionnaire solicited data about

management practices carried by the respondents in the area. Other data collected were factors behind dwellers participation in environmental management practices, and dwellers' perceptions on environmental management practices. The questionnaires for interviewing households and checklists guide for interviewing municipal staffs are shown in Appendix 1.

3.4.2 Secondary data

Secondary data included information from previous studies on environmental management practices such as tree planting, domestic waste collections, gardening, and urban agriculture. Information was collected from Sokoine University of Agriculture National Library (SNAL), University of Dar es Salaam (UDSM), Ministry of Natural Resources and Tourisms, National Environmental Management Council (NEMC) and from various environmental management departments at Kinondoni Municipal Council office.

3.5 Data Analysis

The data from questionnaires were summarized, edited and coded. The coding involved structuring the responses from the open and closed ended questions and assigning them nominal values for analytical purposes. Both quantitative and qualitative data were fed in the computer and analyzed using the Statistical Package for Social Sciences (SPSS) computer programme. Both descriptive and inferential statistical analyses were carried out according to Bailey (1994) and Kothari (2004). Descriptive statistical analysis, mainly concentrated on frequencies, cross-tabulations, percentages, standard deviations, range and correlation of variables including education levels, income levels, residential status, marital status, household size and occupational status of the respondents.

For inferential statistical analysis, linear regression model was used to establish if urban environmental score could be predicted by factors such as tree planting practice, gardening practice, cleaning surrounding practice, urban agriculture practice, domestic waste collection practice, and cutting grass practice. Therefore, the dependent variable was urban environmental score, and this was regressed against independent variables such as tree planting practice, gardening practice, cleaning surrounding practice, urban agriculture practice, domestic waste collection, and cutting grasses. In this study, the regression coefficient (ß) was used to predict the impact of the independent variables on dependent variables. To assess the explanatory power/goodness of fit to regression model a coefficient of determination, (R^2) was employed. R^2 shows the strength of relationship between dependent and independent variables.

The general model used was as follows.

$Y_i = a + b_i X_i + e$

Where,

Y_i= the ith the observed value of dependent variable (environmental score)

X_i=the independent variables

X_1=Tree planting

X_2=Domestic waste collection

X_3=Gardening

X_4=Cutting grass

X_5=Urban agriculture

X_6=Cleaning surrounding

a= a constant showing intercepts,

bi= independent variable coefficient (slope or change in Y per unit change in X);

e= Random error,

i=1, 2, 3 etc. when n is the total number of variables.

CHAPTER FOUR

4.0 RESULTS AND DISCUSSION

4.1 Socio-economic and Cultural Characteristics of Respondents

Socio-economic, cultural, and political factors that characterized respondents' daily activities were incorporated in this section. The characteristics included age, sex, marital status, education level, duration of staying in the area, household size, and respondent's place of origin, income level, occupation status, settlement status, and residential classification. These characteristics were chosen in order to get an overview of the composition and status of the respondents for determining the implication of these in relation to environmental management practices carried in the study area.

Table 3 summarizes the socio-economic information on age, sex and marital status of the respondents. Among the 85 respondents had their ages ranging from 23 to 71 years old, two third of them 54(63.5%) being in the age group 26-50 years, followed by 28(32.9%) who belonged to 51-75 years age group, and three (3.5%) belonged to <25 years age group. However, the chi-square test results indicated that there were significant variations among the age groups of the respondents. Further, the study observed that environmental management practices were positive significantly correlated with the age of the respondents (β = 0.338; $p<0.05$) (Table 4). In the study, 49(57.6%) of the respondents where males, while 36(42.4%) were females. The results indicate that, there was no significant variation between the sexes of the respondents ($p>0.05$). However, relationship between sex of respondents and environmental management practices did not exist ($p>0.05$) (Table 4). This indicates that sex of respondents does not influence environmental management practices in KMC.

Of all the 85 respondents, 17(20%) were single, 59(69.4%) were married and nine (10.6%) were widowed. The chi-square test results revealed that there were no significant relationship between marital status of the respondents (p>0.05).

Table 3: Characteristics of respondents (N=85)

Variables	Components	High density(n=42)	Low density(n=43)	Total	Chi-square	P-value
Age	0-25 years	0(0)	3(3.5%)	3(3.5%)	7.127	0.028
	26-50 years	32(38%	22(26%)	54(64%)		
	51-70 years	10(12%)	18(21%)	28(33%)		
				85(100%)		
Marital status	Single	7(8%)	10(12%)	17(20%)	1.535	0.464
	Married	29(34%)	30(35%)	59(69%)		
	Widow	6(7%)	3(4%)	9(11%)		
				85(100%)		
Sex	Male	25(29%)	24(28%)	49(57%)	0.12	0.729
	Female	17(20%)	19(22%)	36(42%)		
				85(100%)		
Education	Primary	29(34%)	2(2%)	31(36.5%)	44.063	0.0001
	Secondary	10(12%)	13(15%)	23(27%)		
	Tertiary	3(4%)	28(32%)	31(36%)		
				85(100%)		
Years of residence	0-15 years	24(28%)	35(41%)	59(69%)	8.231	0.016
	16-31years	13(15%)	8(9%)	21(24%)		
	32-47	5(6%)	0(0)	5(6%)		
				85(100%)		

The study also revealed that marital status did not influence the environmental management practices. This is because the marital status was not significantly related with the environmental management practices (p>0.05).

The survey also revealed that about 27% of the respondents had at least attained primary education and 37% attained secondary education and tertiary training, respectively. In addition, chi-square test results revealed that there was a significant relationship between education levels of the respondents ($p<0.05$). Such categorization increased the ability of an individual to understand, interpret and practice environmental management activities in their areas. However, those with higher education had added advantages over those with low education levels in practicing environmental management activities. This was confirmed in this study that level of education of respondents was positive significant related with the environmental management practices ($\beta = 0.317$; $p<0.05$) (Table 4).

Table 4: Correlation results between background characteristics and environmental management practices

Variables	Unstandardized β	Std error	Standardized β	It statisticsI	p-value
Settlements	-1.246	0.475	-0.362	-2.626	0.010
Age	0.094	0.037	0.338	2.533	0.013
Sex	-0.048	0.717	-0.007	-0.066	0.947
Marital status	-0.150	0.643	-0.025	-0.233	0.816
Educational level	1.190	0.556	0.317	2.139	0.036
Duration of staying	-0.071	0.045	-0.174	-1.562	0.122
Constant	10.922	2.272	-	4.808	<0.0001

SS = 875.953; df = 84; MS = 38.631; F = 4.678; $p < 0.0001$

The results, further, revealed that about 69% of the respondents had at least stayed in the area for a period not exceeding 15 years, while 25% had stayed in the area between 16 to 31 years and 6% stayed in the area between 32 to 47 years. However, the results showed some significant variations between durations of the respondents living in the study area

($p<0.05$) (Table 3). However, the duration of staying in the residential area did not influence the environmental management practices ($p>0.05$) (Table 4).

4.1.1 Household sizes, settlement status, and income levels

Table 5 shows the household sizes, settlement status and income levels of the respondents. The households' sizes were categorized into major four sections. The study found out that households having 0 to 4 members accounted for 13%, while 5 to 9 members accounted for 69.4%, 10 to 14 members 15.3% and 15 to 19 members 2.4%. The Chi-square test results indicated that there were some significant variations among household sizes of the respondents ($p<0.05$). Table 6 shows that there were no significant relationships between household size and the environmental practices ($p>0.05$), despite the coefficient show a positive relationship between the variables ($\beta = 0.028$). The positive relationship between the variables may be interpreted that the more the members in the household the higher the involvement of the household in the environmental management practices.

It was also found out that about 79% of the respondents lived in their permanent settlements, while 9.4% rented houses from private owners and parastatals and 11.8% migrated to the area from other parts of Tanzania. The results show significant variations between residential status of the respondents ($p<0.05$) (Table 5). Further, the study observed that there was a positive significant relationship between the types of residential tenure and the environmental management practices ($\beta = 0.389$; $p<0.05$) (Table 6).

Furthermore, income levels of the respondents were categorized into three groups namely: low level starting from 0 to 1 500 000 Tsh, which accounted for 68.2%, medium level from 1 500 001 to 3 000 000 Tsh (15.3%) and high level from 3 000 001 Tsh to above (16.5%). The results from chi-square test show a statistical significant difference on the level of income among the respondents ($p<0.05$).

Table 5: Household sizes, settlement status and income levels (N=85)

Variables	Components	High density (n = 42)	Low density (n = 43)	Total	Chi-square	p-value
Household size	0-4 people	4[1](5)[2]	7(8)	11(13)	10.412	0.015
	5-9 people	25(29)	34(40)	59(69)		
	10-14 people	11(13)	2(2)	13(15)		
	15-19 people	2(2)	0(0)	2(2)		
				85(100)		
Settlement status	Rent	3(3)	5(6)	8(9)	12.296	0.002
	Permanent	39(46)	28(33)	67(79)		
	Transfer	0(0)	10(12)	10(12)		
				85(100)		
Income levels	0-1 500 000	40(47)	18(21)	58(68)	27.930	<0.0001
	1 500 001 - 3 000 000	1(1)	12(14)	13(15)		
	3 000 001 and above	1(1)	13(15)	14(16)		
				85(100)		

[1]Frequency [2]Percentage

Despite the highly significant variations in income levels of the respondents, the relationship between the income level and the environmental practices was not significant different ($p>0.05$). However, a positive relationship between the variables was observed ($\beta = 0.193$) (Table 6). This positive relationship indicates that the higher the income of the household the higher the involvement of the households in the environmental management practices.

These data reflected a big variation in environmental management practices between the respondents in low density areas against those in other areas. The respondents in low density area had enough money to pay for proper maintenance of their surroundings while those in other area had little of this resource. Based on the NEMC environmental

management policy of community participation, those with higher income had several advantageous in managing the environment. They implemented several environmental management practices in a sustainable way compared to those with low incomes as the latter faced several limitations in managing their surroundings due to water scarcity, lack of money, limited space, and limited access to innovations.

Table 6: Relationships between household sizes, settlement status and income levels and environmental management practices

Variables	Unstandardized β	Std error	Standardized β	It statisticsI	p-value
Household size	0.032	0.124	0.028	0.263	0.793
Income per year	4.441E-7	<0.0001	0.193	1.825	0.072
Type of resident	0.475	0.0123	0.389	3.861	0.0001
Constant	8.577	1.615	-	5.309	0.0001

SS = 875.952; df = 83; MS = 58.312; F = 6.655; p < 0.0001

In addition, the study found out that less than half of the respondents 37(44%) were self employed as petty business people, food vendors, carpenters, tailors, builders, etc, followed by 21(26%) who were employed in the public and private sector as civil servants, teachers, accountants, engineers, bankers, doctors, etc. Few respondents (16%) were retired from civil services, while 14% house wives. This heterogeneous situation of the respondents' occupation largely favoured the financing of the environmental management practices in the residential areas.

4.2 Participation in Environmental Management Practices

The study found out that 93 percent of the respondents participated in one or more environmental management practices like tree planting, domestic waste collections, urban agriculture, cleaning surrounding, cutting grasses, and gardening. Based on residential status categorization, respondent's participation in these activities faced several setbacks,

which included socio-economic, political, and cultural factors resulting into variation in participation. From discussions held by key informants, it was revealed that limited plot sizes, differences in per capita income, and education levels of the respondents were among the major reasons for the variation in environmental management practices in the residential areas.

4.2.1 Tree planting practice and urban agriculture

The results from Table 7 indicate that, tree planting environmental management practice and residential location are statistically significant at $p<0.05$ level. Out of all 85 respondents interviewed, 93 and 60 percent in low-density and high-density areas respectively indicated that they participated in environmental management through tree planting around their houses for shade, ornamental, fruits, fencing, and medicine (Appendix 3). Out of 43 respondents interviewed, 40(93%) respondents were found to be participating in tree planting due to the availability of space surrounding the premises as well as the availability of water for irrigation and absence of animal disturbances. Out of 43 respondents interviewed in these areas only three (7%) had not planted even a single tree around their homes due to the presence of concrete floor surrounding their buildings which completely hindered tree planting.

The study revealed that in low planned density areas like Oyster Bay, Sinza A, and Mpakani B, majority of the respondents 40(93%) had at least planted 3 to 4 trees around their houses. With enough space and availability of water in these areas, the respondents were able to plant and maintain trees without destroying building walls, and fences.

Table 7: Environmental management practices done in the study area (N=85)

	High Density(n=42)				Low Density(n=43)				Total(N=85)				Chi-square	
	Yes		No		Yes		No		Yes		No			
	n	%	n	%	n	%	n	%	N	%	N	%	x^2	P-value
Tree Planting	25	60	17	41	40	93	3	7	65	77	20	24	13.3	0.00
Domestic Waste Collection	42	100	0	0	43	100	0	0	85	100	0	0	0	0.73
Urban Agriculture	6	14.3	36	86	20	47	23	54	26	31	59	69	10.39	0.00
Gardening	20	48	22	52	40	93	3	7	60	71	25	29	21.097	0.04
Cleaning Surroundings	40	95	2	5	43	100	0	0	83	98	2	2	2.096	0.14
Cutting Grasses	2	5	40	95	16	37	27	63	18	21	67	79	13.401	0.00

According to Sydnor (1994) observation, a space between a tree and a building differs depending on the species to be planted. Normally, the respective municipal authorities are supposed to have specified guidelines to people on issues regarding spaces to leave between planted trees and their buildings. Furthermore, through observations, it was revealed that some trees species, particularly those with small branches notably *Saraca longifera* (Muashoki) were planted near the houses, but had minimum effects on buildings.

The efforts in tree planting in unplanned high- density areas of Msasani Bonde la Mpunga, Mhalitani and Sinza E were constrained by lack of space, water, money and animal disturbances. About 17(41%) of the respondents who were interviewed in unplanned high-density areas indicated space as seriously affecting their efforts in tree planting practice around their premises. Furthermore, discussions with key informants revealed that these areas lagged behind in several other environmental management practices due to limited space. The plot size of these areas was only 600 km^2, thus, the respondents could not plant many trees around their premises. Generally, it was observed that many people in these areas were interested in tree planting, but they avoided to plant trees as some of the trees have lateral roots that damage walls of their buildings.

Furthermore, livestock notably goats and poultry threatened tree planting efforts in these areas as most of the livestock were kept under free-range system. Some respondents revealed that whatever tree species had planted during tree planting day for the past three years ago had been destroyed by these animals despite the presence of municipal by-laws, which prohibited the residents from practicing free grazing systems. In addition, water scarcity has been mentioned as another major obstacle towards tree planting campaign, and other environmental management activities in high-density areas.

About 71 percent of the respondents condemned poor water supplying services from Dar es Salaam Water Supplying Company (DAWASCO) in these areas as one of the barriers for tree planting. Water supply in these areas was not well managed by the authority due to poor water supplying infrastructures as most of water pipes had not been rehabilitated and serviced for a long period. In some areas, it was observed that some underground water pipes both plastic and concrete ones have been destroyed by heavy motor vehicles, due to their being exposed to the earth surface hence causing water logging in the areas.

The results from Table 7 indicate that urban agriculture environmental management practice and residential location were statistically significant at $p<0.01$ level. This means that, residential location had impact on the respondents' participation in sustainable urban agriculture. The field survey in high-density areas of Msasani Bonde la Mpunga, Mhalitani and some parts of Sinza E, revealed that out of 42 respondents interviewed in these areas, only 6(14%) respondents sustainably participated in livestock keeping using zero grazing system, while the remained 36(86%) respondents were not sustainably participating in urban agriculture. These activities resulted into severe environmental degradation. As Mlozi (1995) found out that in Dar es Salaam noxious odours from livestock activities caused a major public nuisance to neighbours. According to the author, there was poor quality of livestock, close proximity of sheds to houses, and the improper disposal of animal wastes, and livestock owners' lack of knowledge about animal husbandry, all of these had negative impact on the urban environment.

In addition, Cohen (1992) noted that domesticated animals were a source of a wide range of infectious agents that pollute the environment. It is believed that domestic animals are an ultimate source of many modern human infections, including most of epidemic diseases. Furthermore, according to interviews with key informants especially the

municipal healthy officers, it was reported that many livestock keepers in high-density areas were either fined by the municipal authority due to poor systems they use to keep their livestock or having their animals confiscated by the authority and fined. On other hand, observations in less congested areas of Oyster Bay, Sinza A, and some parts of Mpakani B, showed that out of 43 respondents interviewed, only 20(47%) participated in urban agriculture by adhering to proper animal keeping methods such as zero-grazing which caused less damage to the surrounding environment. As for tree planting, it was observed that the respondents in the high- density areas of KMC participated less in growing plants due to limited space and shortage of water for irrigation purposes. However, a few of these residents grew vegetables along the valleys and many of these used untreated sewage water to irrigate their plants.

4.2.2 Waste collection practice

The results from Table 7 indicate that waste collection practice was statistically not significant with residential location in the study areas ($p>0.05$). This implies that domestic waste collection practice was among the major environmental management practices that the respondents carried out most in the residential areas. The study found out that all the respondents interviewed 42(100%) and 43(100%) in high-density and low density areas, respectively indicated to have been participating in domestic waste collection activities.

It was observed that most of the waste from kitchens were collected by either municipal/private vehicles or wagons owned by self employed individuals. The garbage collectors normally take the garbage to different domestic waste collection points. There after the municipal trucks collect and transport them to the main landfills. Out of 42 respondents interviewed, 30(71%) agreed that the overall process of domestic waste collections to the landfills particularly by private companies' vehicles was a problem.

According to the key informants discussion, it was revealed that the problem was attributed to poor infrastructure, lack of working gears, low capabilities of waste collection and disposal, and poor planning of the residential areas particularly in highly congested areas of Mhalitani, Bonde la Mpunga and some parts of Sinza E. For instance, NEMC (1997) observed that, most parts of urban areas were not easily accessed by refuse trunks due to poor planning, and that this trend affects about 60-70 percent of the urban population in Tanzania. This means that the remaining 40% of solid waste has to be disposed by other means such as disposal pits or incineration. Such a practice increases air pollution in the atmosphere.

Furthermore, 20% of the respondents at Sinza E were more interested with the daily domestic waste collection services offered by individual waste collectors than the private companies and municipal vehicles, which collect waste three to four times per month, which cause the garbage to accumulate and produce stench. Majority of the environmental management stakeholders agreed that the overall process of domestic waste collections was a big problem in KMC due to inadequate services from waste management contractors', poor planning of the settlements, high population density and poor infrastructure. In addition, municipal officials pointed out that the amount of waste collected was very low compared to what was generated by dwellers in the residential areas. These findings are supported by Kironde and Yhdego (1997) who found out that a large part of waste was buried or burnt on sites, disposed off haphazardly by roadsides, in the open spaces, undeveloped plots and in the valleys and storm water drains. For instance, in Sinza E, Msasani Bonde la Mpunga, and Mhalitani streets, many domestic wastes were disposed close to the houses, along feeder roads, in the stream valleys and in the open spaces. Such waste produced odour that spread all over the place. During the FGDs, the same observations were pointed out.

The situation was somehow different in Mpakani B, Sinza A and Oysterbay, due to space advantage, good infrastructure, ability of dwellers to pay for waste disposal services and better solid waste disposals.

4.2.3 Gardening practice and clean surrounding

The results from Table 7 indicate that, gardening practice and residential location was statistically significant related ($p<0.05$). Out of all 85 respondents interviewed, 70% participated in residential environmental management through gardening practice. Urban gardening in residential areas was practiced on roof, atriums, balconies, window boxes, and in containers such as baskets, buckets and metal gallons. It was observed that 93% of the respondents in low-density areas of Oyster Bay, Sinza A, and Mpakani B, actively participated in gardening due to the availability of water for irrigation and space. The results from Table 5 showed that out of 43 respondents in these areas, 25(58%) had stable income, which enabled them to participate in gardening by employing labour to be used in gardening activities.

In high-density areas, out of 42 respondents only 20(48%) participated in gardening. The results from interviews of the respondents in high density areas indicate several constraints for gardening which include shortage of water, lack of space, and presence of livestock that destroy crops. Also, the respondents in high density areas mentioned incomes as another obstacle to better environmental management practice through gardening. This is indicated in Table 4 whereby 40(47%) respondents out of 58(68%) received less than Tshs 125,000 per month which was not enough to make them participate effectively in environmental management practices through gardening. The results from Table 7 indicate that cleaning surrounding and residential location did not vary between high and low-density settlements ($p>0.05$).

The study found out that, out of 85 respondents interviewed, 98 percent in both low-density and high-density participated daily in cleaning their surrounding environment. This involved cleaning the floors, collection of fallen leaves and garbage, and cleaning of outdoor toilets. During key informants interview, it was noted that the KMC monitored these practices closely in both residential and commercial areas in order to control the sporadic outbreaks of infectious diseases notably cholera and diarrhoea. They further reported that KMC municipal officials involved urban dwellers in cleaning water streams and drainage systems to reduce malaria cases.

4.2.4 Cutting grasses

Table 7 indicates that cutting grasses practice and residential location was statistically significant ($p<0.05$). It was indicated that out of 85 respondents, only 18(21%) participated in cutting grasses surrounding their premises as part of environmental management practice. The results from the interview with the respondents, key informants and field observation revealed that very few urban dwellers participated in cutting grasses in both density areas. For instance, in low-density areas such as Oyster bay, 56 percent of the respondents indicated that they participated in cutting grasses, while in areas of Sinza A and Mpakani B, few households were involved in this task as the majority of houses had a concrete floor around them and no space was left for planting grass. Further, in the unplanned residential areas of Mhalitani, some parts of Sinza E, and Msasani Bonde la Mpunga only 5 percent of the respondents participated in cutting grass. The reasons reported include shortages of space, shortages of water from DAWASCO, animal disturbances, and presence of concrete floor around the houses.

4.2.5 Source of information about environmental management practices

The study revealed that there was a variation among respondents in terms of acquiring information from various sources about environmental management practices (Table 8). The results from Table 8 indicate that sources of information such as television and journals and the location were statistically significant related ($p<0.05$). Many respondents in the study area acquired information about environmental management practices from the television (81%) and (100%) for high-density and low-density respectively, radio (98%) for high-density and (100%) for low-density, and newspapers (93%) for high-density and (100%) for low-density. Being one of the capital city's municipalities, KMC had more than 10 TV stations, seven radio stations and 20 newspapers which among others gave urban dwellers education about environmental management practices. Added to, Table 8 shows that in high-density areas, about 67 percent of the respondents recognized the role played by public meetings in providing them with environmental management information.

However, observations revealed that unlike respondents in unplanned density areas respondents in low-density areas had an advantage compared to those in unplanned density areas in acquiring environmental management information from the mass media. This was because of the income gaps between the two groups, in that respondents in the latter were able to pay for broadcasting programmes offered by private TV stations on monthly basis. This observation concurred with that of Natai (2004) who pointed out that environmental education could spread faster if the mass media could be efficiently used. Furthermore, the author added that it was through television that describes environmental degradation and can enable the community be easily believe and change their attitudes towards environmental degradation. In the discussions with key informants, it was revealed that participation in environmental management practices in high- density areas

was highly motivated by public meetings organized by local leaders, environmental management NGOs and environmental management campaigns like tree planting day.

Table 8: Source of information on environmental management practices (N=85)

	High Density(n 42)				Low Density(n=43)				Total(N=85)				Chi-square	
	Yes		No		Yes		No		Yes		No			
	n	%	n	%	n	%	n	%	N	%	N	%	x^2	p-value
Television	34	81	8	19	43	100	0	0	77	91	8	9	9.04	0.002
Radio	41	98	1	2	43	100	0	0	84	99	1	1	1.036	0.31
Newspaper	39	93	3	7	43	100	0	0	82	97	3	3	3.184	0.07
Journal	6	14	36	86	21	49	22	51	27	32	58	68	11.702	0.00
Public meeting	28	67	14	33	8	19	35	81	36	42	49	58	20.102	0.68
Seminars /workshops	5	12	37	88	4	9	39	91	9	11	76	89	0.152	0.69

4.2.6 Factors influencing participation in environmental management

Table 9 shows factors that influence respondent's participation in environmental management practices in residential areas. Out of these factors only two factors namely: municipal guidelines and residential space were statistically significant related with the residential location ($p<0.05$). The results from Table 9 indicate that the respondent's participation in environmental management practices in low-density areas was influenced by education of the respondents whereby out of 43 respondents interviewed in this area, 98% admitted that education enabled them to participate in various environmental management activities in the residential areas. Education levels of the respondents

increased the ability to understand, analyse, interpret and integrate with various environmental practices. Education facilitates understanding of the nature of Tanzania's environmental management problems (NCSSD, 1994). In addition, the respondents pointed out other factors such as culture (91%), mass education (74%), by-laws (65%) and supporting infrastructure (58%), which influence their participation in residential environmental management. According to observations, many houses in low-density areas had enough space of around 600-1800 km², making it easy for people in these areas to participate in environmental management practices. In addition, the availability of tap water from DAWASCO enabled the residents to effectively practice gardening, tree planting, and urban agriculture.

Table 9: Factors influencing participation on environmental management activities

	High Density(n=42)				Low Density(n=43)				Total(N=85)				Chi-square	
	Yes		No		Yes		No		Yes		No			
	n	%	n	%	n	%	n	%	N	%	N	%	x^2	P
Municipal bylaws	33	79	9	21	28	65	15	35	61	72	24	28	1.89	0.16
Education	23	54	19	46	42	98	1	2	65	77	20	23	21.74	0.25
Supporting infrastructure	1	2	41	97	25	58	18	42	26	31	59	69	31.11	0.18
Education through media	26	62	16	38	32	74	11	26	58	68	27	32	1.53	0.16
Municipal guidelines	37	88	5	12	23	53	20	47	60	71	25	29	12.25	0.00
Culture	41	98	1	2	39	91	4	9	80	94	5	6	1.83	0.17
Space	0	o	42	100	11	26	32	74	11	13	74	87	12.34	0.00

Table 9, also indicates that in high-density areas of Bonde la Mpunga, Mhalitani, and Sinza E, the respondents' participation in environmental management was influenced by culture (98%), municipal guidelines (88%) and municipal by-laws (79%). Out of 42 of the

respondents interviewed in these areas, nobody indicated space as a factor that influenced their participation in environmental management. During key informant interview, it was revealed that areas with congested settlements were frequently inspected by municipal health officers in order to countercheck if residents were abiding by the introduced municipal guides and bylaws on residential cleanness.

4.3 Attitude and Knowledge about Environmental Management Practices

It was important to obtain information about attitudes and knowledge of the respondents on environment management practices to get an insight on how the problem was perceived and the solutions sought in management practices. Largely respondents' knowledge and attitudes were determined by their practices towards management of residential environment. In this study, attitudes and knowledge of respondents about environmental management practices were measured by their education levels, and their participation in environmental management practices.

The study found out that about 88 percent of the respondents understood the concept of environmental management practices. Being one of the municipals in the capital city, the respondents in the study area had several socio-economic, political, cultural, and administrative advantages, which enabled them to interact with various sources of information as indicated in Table 8. In respect 73(85%) out of the 85 respondents interviewed from both in the high-density and low-density areas supported the role played by information media such as radio, television, and newspapers in educating them about environmental management activities. Such a variation among respondents on sources of information played a vital role on their participation in environmental management practices in the residential areas.

In addition, education level of the respondents had an impact in determining the respondents' attitudes to and knowledge about environmental management practices in the residential areas. The results from Table 3 show that 54(64%) out of 85 respondents had education above primary level which was fair enough for acquiring environmental management techniques from various information media. The respondents with higher education level (form VI and above) as opposed to those with lower education level were able to integrate environmental issues with other sectors of development, and forecast future impact of poor environmental management with other measures to conserve it (Natai, 2004).

It was observed that, in low-density areas where residential plot size ranged from 1201 to 1800 m^2, availability of water from DAWASCO together with higher education levels of the respondents modified the surrounding environment. Meanwhile, in high-density areas (plot size 0 to 600 m^2), it was also observed that despite the limited space they had, municipal guidelines and by-laws played a vital role in mobilizing the respondents to participate in management practices. Some key informants suggested that, the Ministry of Natural Resources and Tourisms, environmental management NGOs and local government authorities had strategies for improving residential environmental surrounding, such as tree planting campaigning day on 1st January every year. In addition, the World Environmental Day on 05 June every year enables the urban dwellers in collaboration with environmental management groups/activists to participate in various environmental management activities like cleaning of water drainages around people's settlements, planting trees, and domestic waste collections.

4.4 Variations in Environmental Management Practices in KMC

The results in Table 7 show variations in environmental management practices done by respondents in residential areas. Management practices such as tree planting, urban agriculture, and cutting grass were statistically significant related to low density streets in the study area ($p<0.05$). On the other hand, domestic waste collections, cleaning surrounding and gardening were not statistically significant related to residential location ($p >0.05$). In comparing the respondents from two locations that is low density and high-density areas participated in urban agriculture as follows 20(47%) in low-density while 6(23%) in high-density, cutting grass 16(37%) in low-density while 2(11%) in high-density, and tree planting 40(93%) in low-density while 25(59%) in high-density. The reason for the variation being that, planned areas had bigger plots, availability of water, sustainable income, higher education levels while unplanned areas had limited space, lack of water, and low incomes among dwellers.

However, the respondents slightly differed in environmental management practices as follows: 42(100%) in high-density areas and 43(100%) in low-density areas indicated to have been participating in collecting domestic wastes, and 42(100%) in high-density areas and 43(100%) in low-density areas indicated to have been participating in cleaning the surroundings. According to discussions with key informants, especially the municipal officials, these variations were due to frequent enforcement of by-laws by health officials. Municipal bylaws required that urban dwellers participate daily in environmental cleaning and domestic waste collections in the residences. A fine not exceeding fifty thousand shillings or a term not exceeding six months imprisonment was imposed to any person who contravened these bylaws (DCC, 1989).

4.5 Influence of Socio-economic Factors on Environmental Management

The relationship between environmental management practices of the respondents and some socio-economic factors are shown in Table 10. Education level, income level, and plot size limitation showed a significant influence in the respondents' participation in environmental management practice in the residential areas in KMC ($p<0.05$).

An increase in education level tends to increase people's awareness on the importance of environmental management for sustainable development. Mbwambo (2000) reported that people who are better educated tend to plant more trees for their homesteads as opposed to less educated ones. It was observed that majority of the respondents who had attained tertiary education from various academic institutions had higher participation in various environmental management practices in residential areas compared to those with primary and secondary education levels. This observation concurred with that of NCSSD (1994), which explained that in primary and secondary school levels the understanding of concepts of environment was very limited to both amongst teachers and students. In addition, Katani (1999) found out that, an increase in education level increases the level of awareness and thereby creating positive attitudes, values, and thereby motivating people to manage natural resources sustainably. Generally, education empowers people to integrate various environmental management practices in any given life situation.

Income is one of the factors for attaining sustainable management of natural resources (Fanuel 2002). Table 10 indicates a significant correlation between environmental management practices and household income level ($p<0.05$), implying that household with relative higher income participated more in residential environmental management practices than those with lower incomes. High-income earners have greater potentials to undertake environmental management practices than those with little income, because of

their purchasing power which can make them afford to acquire inputs such as feed, seedlings, medications, manure, and pay hired workers e.g. gardeners, livestock cow boys.

In addition, plot sizes had a significantly limited the respondent's participation in environmental management practices in the residential areas ($p<0.05$). According to interview results, limited plot sizes were reported to limit environmental management practices, especially in high-density areas in urban areas of KMC. In these areas, sustainable environmental management practices like tree planting, urban agriculture, and gardening were severely constrained.

Table 10: Chi-square test results for socio-economic, political and cultural factors influencing environmental management practices

Variable Tested	Chi-square value	p-value
Marital status	1.535	0.464
Education level	44.063	0.0001
Occupation	27.480	0.070
Sex	0.120	0.729
Household size	10.412	0.015
Income	27.930	0.0001
Residence duration	8.231	0.016
Age of respondent	7.127	0.028
Origin of respondent	23.295	0.106
Plot size limitation.	40.623	0.0001

Table 11 presents the results of the regression model of the environmental management practices which were thought to improve the residential environment. The predictors were tree planting, urban agriculture, domestic waste collections, gardening, cutting grasses and cleaning surrounding. Table 11 shows that out of six predictors included in the analysis,

only domestic waste collections and cleaning surrounding were statistically significant related with the environmental management practices ($p<0.05$).

This implies that two predictors of domestic waste collections and cleaning the surroundings had an impact on urban residential environmental in KMC. It was observed that majority of the respondents in the study area actively participated in these practices in the residential areas. In addition, the results from the discussion with key informants revealed that domestic waste collections and cleaning the surrounding in the residential areas were highly emphasized by municipal authority as part of measures against sporadic outbreaks of waterborne diseases such as cholera, and diarrhoea.

Usually, cleaning of drainage systems in the residential areas was done to reduce breeding areas of mosquitoes. Furthermore, practices such as domestic waste collection in the residential areas were highly supervised by municipal health officers and the house owners paid monthly collection fees and whoever failed to pay was fined (KMC, 2004).

Table 11: Regression results of management practices in the study areas

Factors	Beta(ß)	t statistic	p-value
Constant		6.86	<0.0001
Tree planting	0.092	-2.01	0.340
Domestic waste collections	0.332	6.21	0.001
Urban agriculture	0.155	4.94	0.074
Gardening	0.105	-2.51	0.240
Clean surroundings	0.278	5.79	0.002
Cutting grasses	0.153	5.21	0.056

$R^2 = 0.567$

CHAPTER FIVE

5.0 CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

From this study, it can be concluded that about 93 percent of urban dwellers participated significantly to environmental management activities in the residential areas of KMC under the influence of socio-economic, political, and cultural factors. Despite the differences of the residential location, the study found out that, domestic waste collections, and cleaning the surrounding were not related to residential location as the majority of the respondents 85(100%) in low-density areas and 83(97%) in high-density areas actively participated in the environmental management practices.

The study, also, found out that management practices such as tree planting, urban agriculture, and cutting grasses related with the location of respondents' settlements, particularly in planned areas. This implied that, residential location influences the respondents' participation in the environmental management practices whereby due to space advantage, respondents in low-density areas were observed to participate more in tree planting practice, urban agriculture practice and cutting grass practice as opposed to those in high-density areas of KMC. Furthermore, settlement planning policies and availability of supporting management infrastructure such as tap water contribute much to the variation in the quality of residential environment.

In addition, the study found out that, among several socio-economic factors only education levels of respondents, income level of the respondents, and residential plots sizes influenced the respondent's participation in residential environmental management activities. Furthermore, the study has established that among the factors that motivated the

respondents' participation in environmental management, only space and municipal guidelines on environmental management were statistically significant related to the respondent's settlements at ($p<0.05$). This factor favoured the respondents in low-density areas, while other factors such as municipal bylaws, education levels, supporting infrastructure, education through media, and culture were not statically significant related with the respondent's settlements in terms of motivating the respondents' participation in environmental management practices.

Finally, the study found out that among the various sources of information that the respondents used in acquiring information about environmental management practices, only radio, newspapers, public meetings, and environmental management seminars and workshops were not statistically significant related to residential location at ($p > 0.05$). This means that many respondents acquired various types of environmental management information from these sources, while television and journals were statistically significant related to residential location, particularly for the respondents from low-density areas.

5.2 Recommendations

Having analysed the role that urban dwellers play in the management of their residential surrounding environment, the followings recommendations were made to improve their participation.

1. KMC should review the current bylaws dealing with environmental management issues so that they can suit the current settlement situation. Most of the environmental management bylaws that municipal authorities use are based on colonial perceptions and are typically ''command and control'' oriented these

resulting into ineffective laws for environmental management and conflicts between different management stakeholders.

2. The government should empower KMC with money to educate urban dwellers on environmental management issues.

3. KMC should educate urban dwellers on environmental management practices.

4. KMC and NGOs should monitor urban dwellers' involvement in environmental management practices in the residential areas. Many environmental management NGOs and private sectors have been given the mandate to participate in environmental management activities in the residential areas with little or less supervision from municipal authorities. For instance, most of the contracted domestic waste collectors companies had limited and outdated working facilities something that jeopardized workers' as well as dwellers' health.

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APPENDICES

Appendix 1: Household questionnaire

IDENTIFICATION OF RESPONDENT

Questionnaire number.....

Date of interview.....

Region: Dar es Salaam.....

Municipality: Kinondoni

Name of Ward: .....

Name of Street: .....

Density:

1=Low [ ]

2= High [ ]

SECTION A: Biodata

1. Sex of respondent

1= Male

2= Female

2. How old are you .....

3. Marital status

1= Single

2= Married

3= Widow

4= Divorced

4. Region of origin .....

5. Religion of respondent

1= Muslim

2= Christian

3= None

6. Reasons for migration

1= Permanent settlement

2= Rent

7. Duration of staying in the area. .....

8. Education level

1= Primary level

2= Secondary level

3= Tertiary level

4= None

9. Occupation of respondent .....

10. Spouse's occupation .....

11. Household's size .....

12. Respondent's annual income .....

13. Other income generating activities .....

14. Does your house have the following groups of people?

1= Male below 18 years

2= Female below 18 years

3= Male above 18 and below 65 years.

4= Female above 18 and below 65 years

5= Male above 65 years

6= Female above 65 years

15. Do you own any of the following item (Tick which ever is appropriate)

1= Radio

2= Television

3= Electricity connected

4= Electrical cooker

5= House

6= Cattle

7= Vehicle

8= Goats

9= Piped water

10= Well water

11= Motorcycle

12= Bicycle

SECTION B: PERCEPTION TOWARDS ENVIRONMENTAL MANAGEMENT PRACTICES

16: Which environmental management practice do you practice mostly?

1= Tree planting

2= Domestic waste collection

3= Urban agriculture

4= Gardening

5= Cleaning surrounding

6= Cutting grasses

17. Which media of information do you use mostly to get informations about Environmental management practices?

1= Television

2= Radio

3= Newspapers

4= Journals

5= Public meeting

6= Workshops and seminars

18. What are the factors that influence your participation in residential Environmental management practices?

1= Municipal bylaws

2= Education

3= Supporting infrastructure

4= Education through media

5= Municipal guidelines

6= Culture

7= Space

19. Do you keep livestock in your compound?

1= Yes [ ]

2= No [ ]

20. If the answer in question no.19 is yes. Name the livestock that you keep

i) .....

ii) .....

iii) .....

iv) .....

v) .....

21. Which system do you use to keep the livestock that you have domesticated?

1= Free range system.

2= Zero grazing system.

3= Indoor/ fenced grazing system.

22. Have you planted tree in your compound?

1= Yes [ ]

2= No [ ]

23. If the answer in question no.22 is yes, mention tree species that you have planted

i) .....

ii) .....

iii) .....

iv) .....

24. If the answer in question no.22 is no, give reasons for not planting tree

i) .....

ii) .....

iii) .....

25. Do you practice garden in your compound?

1= Yes [ ]

2= No [ ]

26. If the answer is question no.25 is no, give reasons for not gardening

i) .....

ii) .....

iii) .....

iv) .....

v) .....

27. Do you think the size of your plot limit your participation in residential Environmental management?

1= Yes [ ]

2= No [ ]

28. Do you participate in cleaning surrounding?

1= Yes [ ]

2= No [ ]

29. If the answer in question no.28 is yes, how often do you clean your residential Area?

1= Once per day

2= Twice per week

3= Others (specify)

THANK YOU

GUIDING QUESTIONS FOR MUNICIPAL STAFF

Information on residential environmental management practices

1. What are environmental management practices that urban dwellers do to Maintain their surrounding environment?
2. What factors affect dwellers participation in environmental management Practices in residential area?
3. What are the problems that municipal officials faced when supervising Residential environmental management practices?
4. What should be done in order to improve the residential environment?
   - At household level.
   - At municipal level
   - At national level

5. Do urban dwellers respond positively to environmental management practices?
6. Is there any bylaws, guidelines, and regulations set by municipal authority to municipal authority to promote dwellers participation in environmental management practices?

Appendix 2: NGOs staff& Private sectors Checklists

- What are factors that affect your participation in environmental management activities at residential areas?
- Does urban dweller respond positively to your environmental management Initiatives?
- What do you think should be done to improve dwellers participation in environmental management practices at residential areas?

LOCAL GOVERNMENT LEADERS CHECKLISTS

- Does municipal environmental management department perform its duties effectively in your area?
- Which problems do you mostly face when implementing environmental management activities in your area?
- Is there any support that your area receives apart from that of municipal department in maintaining the environmental surrounding?
- Which environmental management activity is mostly practiced in your area?

Appendix 3: Tree species found in the area

Local Names	Botanical Names
Coconut tree	*Bambusa spp*
Orange tree	
Ashock tree	*Polyalthia longifolia*
Umbrella	
Mbilimbi	*Averrhoa bilimbi*
Pawpaws	*Carica papaya*
Indian rubber tree	*Ficus elastica*
Avorcado	*Percea americana*
Msonobari	
Weeping fig	
Mango tree	*Mangifera indica*
Mwarobaini	*Azadiratcha indica*
Palm tree	*Cyrtostachys spp*
Banana tree	*Mussa spp*
Mpera	
Fan palm	*Prichardia thurstonii*
Custard apples	
Flamboyant	
Millingtonia	*Millingtonia hortensis*
Acacia	*Acacia auriculiformis*
Mianzi njano	*Bambusa vulgaris*
Frangspan	*Plumeria rubra*
Mlonge	*Moringa oleifera*
Mlusina	*Leucaena leucocephala*
Cahewnuts	
Mchongoma	*Pithecelobium dulce*
Roistonia	*Roystonia regia*
Mjohoro	*Senna siamea*
Mpanga uzazi	*Terminalia montally*
Mianzi	*Bambusa spp*
Mkrismasi	*Delonix regia*

Local Names	Botanical Names
Mvinje	*Casuarina equisetifolia*
Mteminalia	*Terminalia superba*
Mkaratusi	*Eucalyptus spp*
Mkungu	*Terminalia catapa*
Mzambarau	*Syzygium cumini*
Bottle brush	*Callistemon speciosus*