

INFORMATION AND THE PROBLEMS OF URBAN AGRICULTURE  
IN TANZANIA: INTENTIONS AND REALIZATIONS

by

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## ABSTRACT

Urban agriculture is practised in most Third World societies not as a hobby but as a necessity both for subsistence food production and to earn extra income. Africa, and in particular, Tanzania, is no exception. In Tanzania, and especially Dar es Salaam the practice of urban agriculture damages the urban environment. The question addressed by this study was how to explain the persistence of urban agriculture in Dar es Salaam in the light of its evident damaging effects on the urban environment. This study uses data obtained through (a) documentary sources such as government reports and statistics, and (b) field data from interviews and observations. Interviews were held with twenty-nine urban agriculturalists and twenty-seven public officials.

On average, urban agriculturalists earned annual net profits from livestock enterprises that were about 15 times the total annual salary income of a low income worker, and six times that of a senior public official. The study also found that respondents with high salary earnings also earned high incomes from their urban agriculture enterprises. Most respondents expressed agreement with most statements about the issues about environmental damage due to keeping livestock. However, less than half the interviewees agreed with those statements related to disease-health issues. Most respondents said that people did urban agriculture mainly for economic motivations. They also agreed that people persisted in doing damaging urban agriculture in part because the City Council did not enforce its bylaws. They also said that the government policy explicitly and implicitly encouraged people to do urban agriculture. Most public officials interviewed agreed that

most agriculturalists had knowledge about the damaging effects of their practices.

This study used factors nested at four contextual levels (government, ministry, city council, and individual) to explain people's persistence in doing urban agriculture in spite of its damaging effects. To lessen environmental damage, this study recommends that: (1) A policy be formulated, (2) The government foster multidisciplinary and coordinated participatory educational approaches that adopt holistic views, (3) The City Council enforces its bylaws aided by other parties, (4) MALCD extension agents offer information inequitably. The study also discusses implications and recommendations for policy, practice, and other areas for further research.

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## **LIST OF ABBREVIATIONS**

- ALESA - Agriculture and Livestock Extension Agent**
- CCM - Chama cha Mapinduzi (Revolutionary Party of Tanzania)**
- CBD - Central Business District**
- DCC - Dar es Salaam City Council**
- FAO - Food and Agriculture Organization of the United Nations**
- GDP - Gross Domestic Product**
- GNP - Gross National Product**
- IDRC - International Development Research Centre**
- ILO - International Labour Organization**
- IMF - International Monetary Fund**
- LDC - Least Developed Countries**
- MALCD - Ministry of Agriculture, Livestock and Cooperative Development**
- NEMC - National Environmental Management Council**
- PO - Public Official**
- SAP - Structural Adjustment Programmes**
- SES - Socioeconomic Status**
- TAA - Tanganyika African Association**
- TANU - Tanganyika African National Union**
- TNIS - Tanzania National Informal Sector study**
- T Shs - The Tanzania Shillings**

**UA - Urban Agriculture**

**UAs - Urban Agriculturalists**

**UNDP - United Nation Development Programme**

**US \$ - The United States dollar**

**WHO - World Health Organization of the United Nations**

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## CHAPTER 1

### THE BACKGROUND AND PURPOSE OF THE STUDY

This study is about urban agriculture, its practice in Tanzania and the issues raised by the damage it can frequently cause to the environment. As a study in adult education, it seeks explanations for unanticipated consequences of certain kinds of adult education practice. This first chapter provides the background for the study and describes its purposes and the associated research questions.

#### Background

From about the mid-1970s after many Third World countries gained independence, their economies have been experiencing a decline in primary exports of agricultural raw materials because of the discovery and development of synthetics. Their mineral exports have also sharply declined. The economic malaise has been worsened by external factors such as the oil crisis, and internal factors such as political strife, economic mismanagement, wars, droughts, increased populations, distorted industrialization, and lack of job creation. These and other factors have led to the attrition of civil servant employees, decline of real incomes, increased balance of payments problems, and low productivity, both in rural and urban areas (African Development Bank, 1992; Bukuku, 1993; Nyang'oro & Shaw, 1993; World Bank, 1993a, 1994a). In an attempt to address the continuing decline of their economies, Third World governments have, in general, pursued a variety of policies and practices collectively designed to encourage the involvement of citizens, especially the labour

force, in informal sector economic activities. The principal objectives of such activities include subsidizing the income of individuals as well as production of food. One of these activities has been urban agriculture which emerged as a major urban sector activity during the 1980s (Mazambani, 1986; Rakodi, 1988a; Sanyal, 1985; Tricaud, 1987; Yeung, 1987).

Traditionally, in Third World societies, urban agriculture has been mainly practised by citizens of lower socioeconomic status (SES) background to assist them with food production as well as subsidizing their incomes. Today, however, studies suggest that the activity is no longer the exclusive preserve of people of the lower SES. A wide range of people is engaged in urban agriculture for a variety of social, economic, and cultural reasons (Diallo, 1993; Freeman, 1991; Lado, 1990; Mvena, Lupanga, & Mlozi, 1991; Sawio, 1993; Skinner, 1974). Urban agriculture is a diverse, omnipresent, thriving, and profitable activity in cities all over the world, both for low-income and high-income people (Smit & Ratta, 1992, p. 7). These activities, however, vary enormously, both within and between countries, as well as throughout urban socioeconomic statuses (SES). A decade ago, O'Connor (1983) perceived urban agriculture to be an important part of small-scale enterprises. Surveys from the late 1980s in Bolivia, Egypt, Kenya, India, Mali, Thailand, Tanzania, and Uganda show that poor urban households spent 60 percent--and in some cases as much as 89 percent--of their income on food. In 1990, households in nearly half of the Least Developed Countries' (LDC) largest cities were spending 50 to 80 percent of their average income on food (Ethelston, 1992; Population Crisis Committee, 1990).

In Africa, urban agriculture for food and economic survival is practised everywhere (Diallo, 1993; Gbadegesin, 1991; Gefu, 1992; Khouri-Dagher, 1986; Ngwa Nebasina, 1987;

Schwerdtfeger, 1982; Skinner, 1974; Streifeller 1987; Tricaud, 1987). In central Africa, for example, urban agriculture is the occupation of people of the lower SES because of the difficult economic conditions in their cities (Hartvelt & Gross, 1992; Lee-Smith & Stren, 1991; Ngub'usim & Streiffeler 1982; Streiffeler, 1987). Another example is in Harare, Zimbabwe, where urban agriculture is done by most people (Drakakis-Smith, 1991, 1992; Drakakis-Smith & Kivell, 1990; Mazambani, 1982, 1986; Mbiba, 1994; Zinyama, 1989). Similarly, in Lusaka, Zambia (Rakodi, 1988a, 1988b; Sanyal, 1985, 1986, 1987), and Lilongwe, Malawi (Potts, 1989), urban agriculture for food and income is practised by people of the lower SES. This is also the case in South Africa, where most people of lower SES are practising urban agriculture (Matlala, 1990; Molefe, 1991; Rogerson, 1993). Urban agriculture is omnipresent in Addis Ababa, Ethiopia (Egziabher, 1993, 1994; Wayburn, 1985) as well as in Kenya (Freeman, 1991, 1993; Lado, 1990; Lamba, 1993; Lee-Smith, Manundu, Lamba & Gathuru, 1987; Memon & Lee-Smith, 1993), and Uganda (Maxwell & Zziwa, 1990, 1992).

The rise of urban agriculture, however, has its negative side. It is increasingly recognized that it has "negative impacts on the population and the urban environment and poses new problems for planning" (Rogerson, 1993, p. 37). It is possible that the ubiquity of urban agriculture in most countries causes environmental degradation. For example, domestic animals transmit zoonoses or animal diseases, that are capable of afflicting humans and circulating among other animals (Acha & Szyfres, 1987; Harrison & Sewell, 1991; Madkour & Gargain, 1989; Phillips & Piggins, 1992). The frequency of this infection load increases almost proportionally with the size and aggregation of human population (Cohen, 1992, p.

55). Vegetables and field crops are also a problem because most people claim that they harbour malaria-causing mosquitoes such as the *Anopheles gambiae*. *Culex quinquefasciatus* mosquitoes are probably the most important insect vectors, even in the urban areas: they bear malaria, yellow fever, dengue, *Bancroftian filariasis* (elephantiasis), and lymphatic *filariasis*, along with a number of lesser known diseases (Bradley, 1993a; McGranahan, 1993; Service, 1989; Sutherst, 1993; WHO, 1992).

In Tanzania, the situation is similar to that found generally in Africa. Urban agriculture including the keeping of livestock and growing of vegetables and field crops is done everywhere in towns and cities (Bongole, 1988; Mosha, 1991; Mlozi, 1994; Mvena et al., 1991; Sawio, 1993, 1994; Tripp, 1990; United Republic of Tanzania, 1991). And here too, it is associated with serious problems of environmental degradation. It is in Dar es Salaam city that the problem of environmental degradation brought about by urban agriculture appears to be the greatest. In the city, for example, animal dung not removed from sheds and compounds decomposes, producing odour and acting as a breeding area for harmful bacteria and flies. Animal dung is a source of tetanus (Ellner & Neu, 1992; Rosen, 1975), especially if the animals are left outside to graze. Slurry containing dung, urine and water emanating from dairy cattle sheds, chickens sheds, and pig pens when they are cleaned is not properly disposed of, thereby polluting the surroundings and attracting disease-causing vectors such as mosquitoes. Also, the corpses of cattle and chickens are significant pollutants if they are dumped and allowed to rot on the roads. There is also chemical contamination to humans from the use of acaricide to control East Coast Fever, a disease caused by ticks in cattle. Gaseous pollutants such as ammonia ( $\text{NH}_4$ ), which is repulsive to

neighbours, are on the increase because livestock production has resulted in the conversion of feed into valuable products like milk, eggs, and broiler meat and into less desirable but unavoidable waste products. In the city, livestock also destroy ornamental plants, road, lawns, water lines, telephone lines, parks, fences, and traffic signs. Field crops can also be a problem as evidenced by claims that plants which are over one metre high (banana, maize, cassava) act as hiding places for bandits.

The conventional wisdom has it that a city is a dynamic place for industrial, commercial, and formal employment activities, and is not suitable for agriculture. Given this, and given also that the practice of urban agriculture is damaging the urban environment, then a number of questions arise. Such questions as, for example, why urban agriculture persists and why it persists among such a wide range of the population are fundamental to an understanding of the issue. Other questions are: Do government policies encourage urban agriculture? Do government policies provide education and information to urban agriculturalists? To what extent do those practising urban agriculture recognize its damaging effects? Why, to the extent that they do recognize the damaging effects, do they continue urban agriculture practices? Answers to these and other questions will require an examination of a variety of aspects of the situation: governmental and regulatory, social and economic as well as educational.

### Purpose and Research Questions

It is against such a backdrop that we might explain the contradictions seen in the practice of urban agriculture. Most research and literature on urban agriculture has neglected to

tackle an important issue pertaining to the available information about urban agriculture and how we can explain its contradictions. This study, therefore, sought to complement the existing body of research and literature on urban agriculture in understanding this aspect. This study sought to provide answers to a broad question: How can one explain the persistence of urban agriculture in Dar es Salaam in the light of its evident damaging effects on the urban environment? From answers to this question will flow recommendations for policy action in the urban context.

The pursuit of this broad question will be by examination of a number of more specific ones. These are:

- 1) What is the nature of urban agriculture in Dar es Salaam?
- 2) What damaging effects result from urban agriculture?
- 3) To what extent do people have information about urban agriculture and its effects?
- 4) What are the nature and structure of government policies, agricultural extension and City bylaws concerning urban agriculture?
- 5) What are the nature and structure of economic, social, and cultural factors concerning urban agriculture?

#### Overview of the Dissertation

This chapter has outlined the nature of the problem. The remaining sections of this dissertation have been organized as follows. Chapter 2 examines the history and political economy of Tanzania and the city of Dar es Salaam. The chapter is divided into three main sections. The first section gives a brief history of Tanzania, the second examines its political

economy, and the last looks specifically at the city of Dar es Salaam. Chapter 3 reviews literature pertaining to the phenomenon of urban agriculture and its environmental degradation. There are three sections to this chapter. The first section explores urban agriculture and its benefits while the second section examines urban agriculture and environmental degradation. The last section discusses the role of government in urban agriculture. Chapter 4 explains the research data collection and analysis procedures of the study in three main sections. Section one discusses the selection of respondents, section two examines the procedures for data collection, the last section explains how data were prepared and analyzed. Chapter 5 presents the findings about urban agriculture in Dar es Salaam. The chapter has three sections to it. The first section explains what urban agriculturalists do and section two discusses the damaging effects of urban agriculture and agriculturalists beliefs and knowledge about the effects. The third section examines the reasons people give for persisting in doing urban agriculture in spite of its damaging effects. Chapter 6 provides a discussion and conclusion of the study.

## **CHAPTER 2**

### **TANZANIA AND THE CITY OF DAR ES SALAAM: THE HISTORY AND POLITICAL ECONOMY**

This chapter describes the context in which the study is set. It sketches the history and current state of Tanzania and its political economy, and examines in some detail its largest city, Dar es Salaam. The description begins with a brief summary of Tanzania's emergence from a precolonial region whose boundaries were essentially tribal, and moves on to describe the development of the modern state. In a second section, the state of the economy since the country's independence is presented, with attention paid to the various fiscal crises that have afflicted the country, and its attempts to deal with them. The third section of the chapter, describes the emergence and growth of the country's biggest city, Dar es Salaam. The fourth section is devoted to the city's land use, employment and work patterns. A final section briefly summarizes the chapter.

#### **TANZANIA: A BRIEF HISTORY**

In this section a brief history of Tanzania is examined under six subheadings dealing respectively with Tanzania's precolonial times, Tanzania under German rule and then under British rule and finally with full independence. Two concluding sections deal with the Arusha Declaration, and the inspiration of Nyerere.

### The Region in Precolonial Times

The region currently called Tanzania played host to the first chapter of the human chronicle. This happened because of Mary Leakey's 1959 discovery of the broken remains of a manlike hominid, *Zinjanthropus boisei* ("the Tanganyika human") at the Olduvai Gorge on the edge of the Serengeti Plains. Mary's son, Jonathan later confirmed the earlier human existence at the same sedimentary level of Olduvai by discovering *Homo habilis* ("able human"), a highly skilled toolmaker. History tells us that early humans lived in scattered eastern African locations during the Lower Pleistocene epoch, between three million and one million years ago. *Homo habilis*, however, is thought to be a direct ancestor of *Homo sapiens* or "modern humans." No lineal connection is yet made between the ancient homonids of Olduvai and the people who later populated eastern Africa and the rest of the world (Duggan & Civile, 1976; Kimambo, 1969; Yeager, 1982).

People in Tanzania settled about 10,000 years ago when Khoisan-speaking hunters and gatherers settled along the eastern Rift to the south of Olduvai. These forerunners of the modern Hadzapi and Sandawe peoples may have been the first Tanzanians. The Cushitic speaking people from southern Ethiopia arrived first. These people migrated through the eastern Rift and they later reached an area of northern-central Tanzania in which the Khoisan hunterers and gatherers had settled. These migrants were pastoralists and their cattle flourished in the virgin grasslands of the north. In Tanzania, this is a way of living that is present even today as shown by the modern Burungi, Iraqw, and Gorowa Cushitic-speakers who share the same space with the Khoisan Hadzapi and Sandawe. History tells us that most of the Bantu-speaking people in the country, came during the first millennium

A.D. These people probably originated in southern Nigeria and the Cameroon in West Africa. The Bantu-speakers were iron-working agriculturalists and settled in the wetter areas of western Tanzania and in the fertile volcanic mountains of the northeast. This dispersal of the Bantu to wetter areas avoided conflicts and competition for land with the established hunters, gatherers, and pastoralists of the dry savanna.

The story of how Tanzania has been populated shows that about 95 percent of the 124 tribal groupings are Bantu-speaking. Most of these people had, by the year 1500, moved into the heavy rainfall areas and adopted the banana culture. In Tanzania today, examples include that of the Chagga inhabiting in the northeast, the Haya in the northwest, and the Nyakyusa in the mid-southwest. The Bantu people created complex democratic states, others consisted of small chiefdoms or were organized into large centralized kingdoms. For example, there were big chiefdoms ruled by Ghendewa, Kimweri, Mkwawa, Mirambo, and Sina over the tribes of Pare, Shambaa, Hehe, Nyamwezi, and Chagga, respectively. All tribes were developing and interacting socially, economically, and politically. Tribes maintained contacts with others during trade, peaceful and warlike times. There were also expansion and migration in search of new lands that led to the intermingling and assimilation of people and tribes, of cultures and ideas. "The period between 1500 and 1800 was one of rapid change. There was expansion of societies into areas hitherto considered marginal, and the adoption of new methods of maintaining and controlling the societies" (Kimambo, 1969, p. 17).

### The Period of German Rule

The urge for socioeconomic development and political control of a newly unified Germany prompted it in the early 1880s to look for colonies in Africa ahead of other European regimes. To pursue these needs, Chancellor Otto von Bismarck supported the entrepreneurial efforts of one Karl Peters and his Society for German Colonization. In 1884, Peters travelled to what would become mainland Tanzania and signed a series of agreements with local rulers that ceded administrative and commercial "protection" to the society. In 1885, the society was granted a German government charter to administer a largely undefined territory on the mainland, which it transferred to a new organization formed by Peters, the German East Africa Company. The company initially encouraged German immigrants to establish plantation agriculture of cash crops. Immigrants started farms in the fertile and temperate northeastern highlands, between the Usambara Mountains and Kilimanjaro. Here coffee, cotton, sisal, and rubber were planted using cheap African labour. To further trade with the hinterland and open more agricultural plantations, two railroads were completed: one in 1911 (from Tanga to Moshi), and another in 1914 (from Dar es Salaam to Kigoma on Lake Tanganyika).

However, Germans confiscated prime land, imposed poll taxes, and subjected people to forced labour under poor working conditions, all of which led to bitter resistance against them. The situation escalated to the semi-nation wide Maji Maji Rebellion of 1905 to 1907. During this period, there were four ways through which most Africans showed their reactions and resistance to the Germans.

Some societies fought the Germans by force of arms (active resistance), others refused to cooperate and as far as possible wished to have nothing to do with

German colonials (passive resistance). Other societies adapted or sought to employ the newcomers in a bid to advance their own local cause (African adaptation). Lastly, some peoples saw the arrival of the Germans as an opportunity for lucrative trade" (Gwassa, 1976, p. 85-86).

Germany's defeat in World War I in 1918 ended her colonial rule in eastern Africa.

### The Period of British Rule

Britain occupied most of German East Africa during World War I (from 1916). In 1920, Britain renamed the country Tanganyika, and began constructing an administrative organization that was legalized in 1922 when the League of Nations mandated Tanganyika to the British Empire. Tanganyika was not a British colony, but one to be administered in the interests of "peace, order, good government, of the material, moral well-being, and the social progress of its inhabitants" (Yeager, 1982, p. 12). In 1921, with an area of 942,918 square kilometres, the country had an estimated population of 4,107,000 Africans, 2,447 Europeans, and 14,991 Indo-Pakistanis Asians and Arabs who had settled in eastern Africa as traders and colonial labourers.

In 1925, the British introduced a form of local administration, commonly called "indirect rule" that saw the creation of "native authorities." Here, most of the material progress and political responsibility of the people were mediated by tribal chiefs. Generally, indirect rule for most Africans was complicated and furthered the interests of colonial power. By the early 1930, for example, a racially stratified economic system had emerged: Europeans and Asians controlled the productive and retail trade sectors, and Africans increasingly participated in small-scale commercial agriculture. Like the Germans before them, British

agricultural officers encouraged cash crops such as coffee, sisal, tea, and tobacco over food crops such as cassava, maize, sorghum, and sweet potatoes. Undeniably, cash crops formed a bulk of raw materials that were exported to Britain's industries and earned foreign currency for the country. Under official supervision, African cooperative societies were established to ease in the production and marketing of export crops. Also, during this time, there emerged a few well-educated rural people who were attracted to the country's administrative and trading centres. Here they sought employment as labourers, teachers, and junior civil servants.

Some years later, a few of the educated people began to form associations to articulate their socioeconomic and political concerns. One such organization was the monoethnic Bukoba Bahaya Union, formed in 1924 by a few educated Haya residents. Other ethnic groups later formed similar unions, such as the Chagga, Meru, Shambaa, Sukuma, and Zaramo. In these unions, clandestine discussions about political matters took place. Such discussions led to formation of the Tanganyika African Association (TAA), an ethnically diverse group formed between 1927 and 1929 in the cities of Tanga and Dar es Salaam. Dar es Salaam and Tanga cities were centres of dock workers and they were enduring poor working conditions and wanted a political change. In the 1930s to early 1950s, TAA expanded its membership to include rural Africans, and in 1954 formed the nucleus of the political party, Tanganyika African National Union (TANU) that openly opposed the colonial power. TANU was headed by Julius K. Nyerere who spearheaded Tanganyika's efforts to gain independence from the British on December 9, 1961.

### Independent Tanzania: Population and Institutions

Tanzania was born when Tanganyika and the Zanzibar islands, which had been ruled by the Sultan of Oman from the 1890s and became independent in 1963, united on June 26, 1964. Nyerere became the president of the United Republic of Tanzania. Later, in February 1978, two parties, TANU of mainland Tanzania and the Afro-Shirazi Party of the isles merged to form the Chama cha Mapunduzi - CCM (Revolutionary Party of Tanzania). Mainland Tanzania covers an area of 942,626 square kilometres while Zanzibar is 2,461 square kilometres. The entire State had an estimated mid-1988 population of 27.0 million. Most of its people are Africans, although people of Indian and Pakistani ancestry make up a significant part of the urban population (Berry, 1993, p. 856). The country's population was estimated to have reached about 27.6 million people in 1991 (African Development Bank, 1992). About 80 percent of Tanzanians live in rural areas and depend on subsistence agriculture which contributes about 50 percent to the Gross Domestic Product (GDP). The backbone of the economy is agriculture, livestock, and fishing, which account for over 90 percent of domestic and foreign earnings. The country is one of the least urbanized countries of Africa, with less than six per cent of the population residing in towns at the time of the 1967 census (Berry 1990, p. 1009). The urban population in 1985 was around 14 percent, . . . with a concentration around the port of Dar es Salaam (Hodd, 1991, p. 322). At an annual population growth rate of 2.8 percent, Tanzania will attain about 30 million by the year 2000 (Synge, 1992). The main cities and their population according to the 1988 census are: Dar es salaam (1,300,000), Zanzibar (270,000), Mwanza (171,000), Dodoma (capital, 160,000), Tanga (143,000) and Arusha (88,000) (Carroll, 1991). Since 1988 these

figures have increased: the population of Dar es Salaam for example was estimated to have reached 2.2 million in 1992 (Synge, 1992, p. 194).

Tanzania's central government is governed through a National Assembly that consists of elected Members of Parliament (MPs) from mainland Tanzania and Zanzibar islands. The National Assembly is a legislative house in that it enacts all the legislation concerning mainland Tanzania. Since the constitutional amendments of 1984, the National Assembly comprises 101 members elected from the mainland and up to 55 members elected from the islands. Others are 70 members allocated to women deputies, party organizations, President's nominees, and ex-officio members (Regional Commissioners). The government is led by a democratically elected President who is also the commander-in-chief of the armed forces. The President appoints two Vice-presidents (one from the mainland and another from the islands) from the elected members of the National Assembly. Vice-presidents and the ministers are members of the National Assembly and comprise of the Cabinet that is chaired by the President. As of September 1992 the Cabinet of mainland Tanzania had 20 members (including the president). A member in the cabinet usually heads a ministry.

Local government in Tanzania is the responsibility of the ministry of Local Government (Urban Authorities). Mainland Tanzania is divided into 20 regions and each is headed by a Regional Commissioner. A region is further divided into districts that are each headed by a District Commissioner. Districts are further partitioned into wards that are in turn split into rural villages. In towns and cities, urban administration is the responsibility of a city, municipal or town council, and the former two are each headed by a Mayor. Dar es Salaam

region is an exception, because its three districts (Ilala, Kinondoni, Temeke) consist of urban and rural wards and the Mayor administers only the urban wards. The rural wards are administered under the District Commissioners.

### The Arusha Declaration

The origins of this system of government lie with Julius K. Nyerere. Nyerere, among Tanzanians and the world academic community, is remembered for having chartered a unique form of commitment when he announced the Arusha Declaration in February of 1967. The Arusha Declaration became the blueprint for Tanzanian development for almost three decades (1960s to 1980s). The aim of the declaration was to lessen the increasing elitism, and the emerging class structure. In Nyerere's vision, to change this was eventually going to lead the country to an egalitarian and democratic society by cultivating an ethos of socialism and self-reliance (*ujamaa na kujitegemea*). The policies espoused high ideals for equality and the realization of human potential through collective actions, especially in the *ujamaa* or brotherhood or familyhood villages. In rural areas, *ujamaa* villages were promoted as the basic social and economic unit. In 1973, most scattered rural households were brought to settle in planned villages where social services were to be easily provided. Communal activities were promoted in anticipation that the people would participate socially, politically, and economically. Villages were not just physical locations of households, but they acquired legal status. They were governed by elected councils and had government-appointed civil servants. As legal entities, villages owned land, businesses, trading stores, and communal farms. These ideas also motivated wider national policy.

The ruling party then, Tanganyika African National Union (TANU), also thought that to be self-reliant, all major means of production had to be under State control. In urban centres, the government nationalized the major businesses, commercial banks, large estate farms, transportation, exports, imports, and wholesale trade. State controlled corporations, institutions, or parastatals expanded to manage the various nationalized businesses. What happened over the years was that the parastatals became a fiscal drain (Bukuku, 1993). The government has had to give subsidies to most parastatals in order to sustain their operations.

### The Inspiration of Nyerere

Nyerere was the founder and staunch supporter of the Arusha Declaration together with its ujamaa policies. Nyerere opposed the exploitative and national economic dependency on the external markets, and the country's concomitant import substitution, and the borrowing of foreign exchange. His ideas were for Tanzania to discourage foreign investment and industrialization and concentrate on labour-intensive agricultural development. He believed that industries and money would come, but it would be through the people and their hard work, especially in agriculture. This is the meaning of self-reliance. According to Nyerere, "self-reliant agriculture would also reduce Tanzania's addiction to money and 'humanitarian' foreign aid and thereby inhibit the growth of an internationally subsidized rural class system" (Yeager, 1982, p. 60). One of Nyerere's ardent visions was for the government to provide "free" education, health services, and water to most Tanzanians. Nyerere also believed that leaders were to sacrifice material and social benefits for these things to happen. In 1973, he introduced a leadership code barring party

and government professionals from owning enterprises or businesses which promoted their economic well-being while most of the people suffered in abject poverty. Generally, Nyerere's *ujamaa* and self-reliance as well as his egalitarian social policies were a drain on the country's meagre resources. In order to finance these programs, for example, the country had to receive a great deal of foreign aid from Western sources. Nyerere retired in 1985 after three decades of presidency, having not yet achieved most of his ambitious visions because of the poverty endured by Tanzania. It is this latter issue that we examine in the next section.

## THE POLITICAL ECONOMY OF TANZANIA

This section discusses the political economy of Tanzania by examining the history of crises and the decline of agricultural production and its foreign exchange earnings, mainly obtained from export crops. Later, we discuss inflation and the emergence of income inequalities in urban areas.

### A History of Crisis

Tanzania belongs to the group of the 25 poorest countries in the world and is listed by the World Bank as one of the "debt distressed" low income countries. At the end of 1992, Tanzanian debt to developed countries was US\$ 6.7 billion, out of the external debt of US\$ 204 billion owed by the 32 severely indebted low-income countries (SILICs) (World Bank, 1993a). These other countries included Afghanistan, the Arab republic of Egypt, Ghana,

Kenya, Nigeria, and Zambia. To account for the causes of the Tanzanian economic crisis, two schools of thought have emerged. Some have argued that the root cause of the crisis is in the ujamaa policies: either because they were not "scientific" or genuine (Bukuku, 1993; Babu, 1981; 1994; International Monetary Fund (IMF), 1992, 1993a; World Bank, 1989a, 1992, 1993a, 1993b, 1994a), or in terms of their success in retarding the development of capitalism and their failure to "capture the peasant" (Coulson, 1982; Ellis, 1982; Hyden, 1980; Loftie, 1989). The other group holds the view that the crisis was a result of natural and economic factors - e.g. drought, trade terms, surplus transfer to metropolitan countries, exploitation by the parastatals, and bureaucratic mismanagement (Bryceson, 1993; Kahama, Maliyamkono & Wells, 1986; Nyerere, 1982, 1990; Putterman, 1985, 1995; Rwegasira & Kanneworf, 1980).

The ILO (1982a) and the Tanzanian government have attributed the country's economic problems to two causal factors. The first are mainly external, such as the oil shocks, the drought, the Uganda War, and induced imbalances of trade (Bukuku, 1993; Green, Rwegasira, & van Arkadie, 1980; Morrissey, 1995). The second is the internally aggravated poor national productivity and economic mismanagement (Bevan, Collier & Gunning, 1993; Hyden & Karlstrom, 1993; Lofchie, 1989; Sharpley, 1985). The economic crisis of the early 1980s has been characterized as the gradual construction of a geopolitically dispersed, import-intensive, urbanized economy, critically dependent on expanding agricultural surpluses to feed the urban population and earn foreign exchange (Bienenfeld 1989 quoted by Sarris & van den Brink, 1993). During the period from 1977 to 1988, real GDP grew at an annual average rate of 1.9 percent, below the population growth rate of 3.2 percent per

annum (Bukuku, 1993; Campell & Stein, 1992; IMF 1992, 1993a; Maliyamkono & Bagachwa, 1990; Mans, 1994; Sarris & van den Brink, 1993, 1994; van Buren, 1994; Wagao, 1992; World Bank, 1993c, 1989a). By the end of the 1970s, 80 percent of the large and medium scale activity was in the public sector, accounting for 44 percent of the gross domestic product (GDP), and the public sector was responsible for 80 percent of the monetary capital formation (Bukuku, p. 5).

After 1977, Tanzania was confronted with an acute and persistent economic crisis. Tanzania fought a Kagera War (also known as the Uganda War) in 1978 and 1979, experienced the breakup of the East African Community in 1977, experienced oil price shocks in 1979 and 1981, and was struck by droughts in 1980 and 1981. The drought which hit many sub-Sahara countries in the mid-1970s was a catastrophe for Tanzania and staples like maize, wheat, and rice had to be imported. During these years, the country imported 0.7, 5.6, 15.3, and 7.1 kilograms of food per person in 1966, 1972, 1974, and 1975 respectively (Msambichaka, 1982). These were years of economic hardship and, during 1976-79 salaries were frozen; conditions which prompted many people to start informal enterprises to increase their real incomes. Since 1979, the economic crisis has threatened Tanzanian political stability and caused it to re-evaluate its development policies. The persistent economic malaise has been characterized by an acute shortage of foreign exchange, balance of payment deficits, large budget deficits, and high rates of inflation. There have also been low, and in some years, negative rates of growth of exports, and declining levels of per capita real income and standards of living (see Tables 1, 2, and 3). Other causes have been low capacity utilization in industries, a decline in the export crop

production, and worsening conditions for the population.

Table 1

Trends of Some Indicators for External Trade From 1981/82 to 1992/93 (US\$ Million)

Year	Exports	Imports	Trade balance	Bal. as % of exports	Petroleum imports
1981/82	570.0	1,079	-509	89.3	226
1982/83	369.0	902	-553	149.2	210
1983/84	347.0	875	-528	152.2	233
1984/85	335.0	950	-615	183.5	237
1985/86	317.0	1,024	-707	223.0	196
1986/87	355.0	1,155	-800	225.4	168
1987/88	362.0	1,185	-823	227.3	160
1988/89	393.9	1,277	-883	224.2	180
1989/90	424.5	1,380	-955	225.0	180
1990/91	393.6	1,381	-987	250.8	246
1991/92	422.4	1,437	-1,012	239.6	181
1992/93	600.0	1,600	-1,000	166.7	200*

Source: Minister of finance budget speech of June 18th 1992, United Republic of Tanzania, Dar es Salaam, p. 69. \*Anticipated outcome.

In 1984, the rate of inflation was 36 percent per annum, 33 percent in 1985, 32.4 percent in 1986, and 31.2 percent in 1988 (Bukuku, p. 180; Maliyamkono & Bagachwa, 1990). Throughout the 1980s, the economy deteriorated because of increases in population, oil prices, and prices for capital and consumer goods. In 1989, for example, Tanzania had a three percent population growth while its economic growth was only two percent ("Growth of National Economy," 1989). Before the launching of the economic recovery program in July 1986 which was designed to reverse the decline in the country's productive capacity and living standards, production had declined steadily in all the major sectors (agricultural and industrial) leading to a decline in per capita real income. For example, in two decades (1971-1991), Tanzania's gross national product per capita was the lowest in Africa at US\$

210 (IMF, 1993b; World Bank, 1993c). This is the basis for the argument that inappropriate domestic policies, equity and efficiency (growth) had been hurt. However, during much of the 1970s and part of the 1980s, the government paid a lot of attention to equity issues (Bukuku, p. 199). According to Bukuku, this distributive aspect was overplayed to the extent that it affected growth and consequently, equity.

After 1986, Tanzania abandoned a centralized socialist planned economy and ushered in a capitalistic one. This was followed by democratization and nationwide privatization, economic liberalization, and the encouragement of private business initiatives. However, seven years later (1993), the economy of Tanzania has not changed much from that of the 1970s and 1980s. Since 1980, to improve its economy, the country has pursued four adjustment programmes: the National Economic Survival Programme (NESP) (1981-1982), the Structural Adjustment Programme (SAP) (1982-85), the Economic Recovery Programme (ERP) (1986-89), and the Economic and Social Action Programme (ESAP) (1989-92). Even with these programs, only modest changes have been made to the traditional agricultural sector headed by peasant farmers who are the main contributors to the country's gross domestic product and foreign exchange. For a country like Tanzania, to bring about a significant jump in its structural change and economic growth, rural agricultural producers' per capita real incomes will first have to be increased.

An increase in per capita real income increases the demand for nearly everything, and for farmers this can occur via their agricultural exports. Revenues from exports can increase per capita real incomes and the country's productive capacity, hence influencing its economic growth. There is reason to believe that unless new agricultural innovations can be

successfully launched and embraced at the local level, no amount of national effort orchestrated centrally from the capital city is likely to succeed, and even a favourable change in the external economic environment, which Africa needs badly as a stimulant for its agriculture, will not permeate or impact the daily life and activities of the African farmer in significant way (Temu, 1992, 97).

### Decline of Agricultural Production

The agricultural sector is the mainstay of Tanzania's economy, providing a livelihood for 90 percent of the economically active population, and accounting for 84 percent of export earnings in 1992. It contributed about 48 percent to the 1989 Gross National Product (GNP) (United Republic of Tanzania, 1989, p. 14). The country earns 70 percent of its foreign currency from the export of four crops. However, most of these crops are produced by small farmers' "subsistence farming," which accounts for an estimated 50 percent of the agricultural output (Campell & Stein, 1992; Hodd, 1991; Maliyamkono & Bagachwa, 1990). The northern and south-western parts of Tanzania are the most fertile, receiving the highest rainfall. The main food crop is maize, followed by cassava and plantains. The main export crops are coffee beans, raw cotton, cloves (from Zanzibar), tobacco, tea, cashew nuts, and sisal.

Tanzanian agricultural production has been declining (Bukuku, 1993; United Republic of Tanzania, 1990a; Wenzel & Wiedenmann, 1989; World Bank, 1984; 1993a) because it is carried out by small farmers using technology that has improved little, and depends on unpredictable and unreliable rains. For example, coffee is mainly grown by small farms and

mostly in the Kilimanjaro region. It accounted for 49 percent of export earnings in 1986, but this share had fallen to 31 percent by 1990 (van Buren, 1994, p. 860). Coffee output fell from 76,880 metric tons in 1981 to 52,000 metric tons in 1991, a 32 percent decline (see Table 2). Cotton production was also unstable during the 1980s which is reflected in amount of exports. Cotton exports fell from 413,664 bales (each 218 kilograms) or 44,480 metric tons, in 1981 to 205,623 bales or 22,110 metric tons in 1985 (see Table 2). In 1988, cotton exports increased, reaching 480,818 bales or 51,700 metric tons, but declined in 1991 to 349, 122 bales or 37,540 metric tons.

Tea production has become an important crop in recent years. Exports of processed tea declined in the 1980s, falling from 15,440 metric tons in 1981 to 9,540 metric tons in 1986. However, in 1987, they increased from 14,020 metric tons to 17,590 metric tons in 1991 due to increased cultivatable hectarage (see Table 2). Sisal was Tanzania's second export crop in the 1960s, but faced sharp declines in the 1970s and 1980s. Sisal exports fell 93 percent from 57,500 metric tons in 1981 to a low of 3,770 metric tons in 1991 (see Table 2). Output of tobacco, Tanzanian's fourth most important export crop, declined from a record 19.1 million kilograms in 1975/76 to 10.7 million kilograms in 1988/89, recovering to 14.2 million kilograms in 1989/90. Other cash crops including cashew nuts, cocoa, sugar, cloves (from Zanzibar), sugar, pyrethrum, and groundnuts also experienced similar declines. These declines also happened to food crops such as maize, cassava, sorghum, millet, rice, wheat and plantains. The combination of all these conditions forced the country in some years to rely on external food supplies which it could not afford because of its inadequate foreign currency earned from exports.

In summary, the country earns most of its foreign currency from the export of four main agricultural crops -- coffee, cotton, sisal, and tea. Table 2 shows that their value and income has been declining.

Table 2

Tanzania's Crop Exports 1981-1992 (Value in US\$ Million and Volume in Thousand Metric Tons)

Year	Exports							
	Coffee		Cotton		Sisal		Tea	
	Value	Volume	Value	Volume	Value	Volume	Value	Volume
1981	157.09	76.88	77.03	44.48	32.47	57.50	20.24	15.44
1982	129.24	54.76	56.06	38.84	24.28	30.68	18.61	11.97
1983	130.29	50.70	61.69	39.84	13.10	26.80	21.79	16.60
1984	153.59	54.96	49.52	28.94	10.54	21.50	17.00	11.10
1985	118.50	44.02	29.60	22.11	3.20	15.49	23.47	11.65
1986	184.67	50.38	30.40	31.69	5.20	15.06	13.61	9.54
1987	109.39	48.34	43.92	42.15	5.88	13.75	17.67	14.02
1988	96.70	38.67	75.26	51.70	4.86	11.19	16.03	11.19
1989	108.04	49.92	64.80	48.04	4.27	8.60	16.16	10.93
1990	83.78	61.14	74.55	46.29	3.95	7.71	21.45	14.90
1991	76.31	52.00	62.05	37.54	1.85	3.77	22.28	17.59
1992	73.57	55.00	63.00	45.00	4.40	8.00	28.07	19.21*

Source: Minister of Finance Budget Speech of 18th June, 1992, United Republic of Tanzania, Dar Es Salaam, p. 74. \*Estimated Values.

### Inflation and the Emergence of Urban Inequalities

From independence in 1961, the ruling party TANU and the government advocated strategies placing a great weight on the development of people and their basic needs. However, these ambitious strategies did not lead to income growth but to declines for rural and urban populations. Wagao (1981) noted an increase in inequality in the distribution of cash income among households between 1969 and 1967-77. Semboja (1983) found that in

the urban areas, household income inequality rose because of inflation. For example, during the decade of the 1970s "about 33 percent of all working class wage earners earned the minimum or less" (World Bank, 1977) (see Table 3). In 1976/77, in urban areas, 59.2 percent of the people got some cash income from trade, enterprise, or profession. In urban areas, there was a sharp increase in the so-called "farm" households living in urban areas between 1969 and 1976/77. For these people, cash income between 1969 and 1976/77 shifted toward crop husbandry and "other," and away from trade or enterprise. Unlike in rural areas, the value of cash incomes in urban areas appeared to have declined in nominal terms for farm households, while it increased by less than 50 percent for non-farm households. Comparing this figure with that of the national consumer price index of the last two quarters of 1976 and the first two quarters of 1977, Sarris and van den Brink (1993) found that there was an enormous decline of 68 percent in urban per capita real income. This was also the conclusion reached by the ILO mission in 1982 (ILO, 1983), and Bukuku (1993). All studies indicate that inequality was much higher in urban areas than in rural areas. In the latter, it was partly because subsistence incomes moderated the inequality significantly.

Like the rural peasant producers, the urban wage earners suffered from large declines in their income during the 1970s and 1980s (Coulson, 1982; World Bank, 1977). Earlier, Barkan and Okun (1979) had shown that salaries of civil servants in Tanzania were among the lowest in Africa. Real income decline is estimated to be 50 percent since the mid 1970s (Bukuku, 1993, p. 62; Maliyamkono & Bagachwa, 1990). Valentine (1981) had estimated a decline of 57.4 percent in the "real value" of the minimum wage between 1974 and 1979.

The World Bank (1984) had estimated a figure of 50 percent of real income decline since the mid 1970s. For urban per capita real income, Bevan, Bigsten, Collier and Gunning (1988) have calculations which show a drop of 15 percent between 1976/1977 and 1984. Using a modified National Consumer Price Index, the real minimum wage declined by about 25 percent between 1968 and 1978, and 70 percent between 1978 and 1988 (see Table 3).

Table 3

Real and Nominal Monthly Wages (T Shs)

Year	Nominal monthly minimum wage	Consumer price index, 1969 = 100	Real monthly minimum wage
1966	150	93.0	161
1967	150	95.4	157
1968	150	98.5	153
1969	170	100.0	170
1970	170	103.7	164
1971	170	107.4	158
1972	240	118.6	202
1973	240	129.0	186
1974	340	169.0	201
1975	380	248.5	153
1976	480	306.7	157
1977	480	358.4	134
1978	480	418.7	115
1979	480	437.3	110
1980	480	512.2	94
1981	600	709.1	85
1982	600	914.0	66
1983	600	1,161.5	52
1984	600	1,581.1	38
1985	600	2,107.4	28
1986	810	2,790.8	29
1987	1,260	3,626.6	35
1988	1,644	4,757.4	35

Source: Tanzania Bureau of Statistics, 1989, United Republic of Tanzania (Jamhuri ya Muungano wa Tanzania), 1988.

A study of income distribution between 1983 and 1989, shows that urban real incomes have increased, but no substantial real income increases occurred in rural areas (Sarris & van den Brink, 1993). In Dar es Salaam, for example, Bevan, et al. (1988) reporting a 1984 study, show that the middle and upper income classes in urban areas had increased their income from farming [urban agriculture]. Wage income and that from business declined the least in the poorest class. A warning needs to be made, however, and that is the large under reporting of urban business income throughout the decade of the seventies and early eighties. During these periods, the ruling party and the government severely discouraged the elite and bureaucrats from involving themselves in private activities to earn any extra income. In reality the discouragement did not work. What seems to have happened during the 1976/77 and 1980s period is that rural and urban households switched their activities from formal, observable ones to informal and unobservable ones, in order to maintain their real incomes (Bukuku, 1993; Sarris & van den Brink, 1993, 1994).

Rapid monetary expansion in the 1970s increased domestic inflation. The rate of inflation has been one of the major causes to affect the distribution of income in Tanzania (Bagachwa & Ndulu, 1988; Bukuku, 1993; Ndulu, 1992; Maliyamkono & Bagachwa, 1990; Mans, 1994; Sarris & van den Brink, 1993; Wagao, 1992). The annual increase in inflation has significantly contributed to the emergence and development of informal enterprises because most urbanites could not make ends meet with their salaried income (see Table 4). Inflation is the means by which the real resources are effectively transferred to the state and to business people in Tanzania. The combined effect of domestic and imported inflation has led to double digit inflation since 1973 with an exception in 1976 (see Table 4). The

inflationary situation grew worse toward the end of the 1970s and between 1980 and 1989, the economy witnessed inflation rates of between 25 and 36 percent (Bevan et al., 1988; Bukuku, 1993; Campell & Stein, 1992; Sarris & van den Brink, 1993, 1994; IMF, 1992, 1993b; United Nations, 1993; World Bank, 1993c) (see Table 4). It is likely that inflation in Tanzania will continue to increase but probably at a lower rate than experienced previously.

Estimates show that the minimum budget for just food for an average household of four at the 1980 price level was more than 600 Tanzanian Shillings per month. In the same year, the minimum wage was T Shs 480, and most wage earners earned no more than T Shs 750 (ILO, 1982b; United Republic of Tanzania, 1979, 1981). Real urban income fell throughout the period from 1977 to 1990 (Bukuku, 1993; IMF, 1993a; United Republic of Tanzania, 1990a; United Nations, 1993; World Bank, 1993a) (see Table 3). Bukuku further says that National Accounts data show that by 1986, the real minimum wage had declined by 70 percent from its value in 1969, the average wage declined by 80 percent, and the top salary declined by as much as 94 percent from its 1969 value. Over the 15 year period leading up to 1984, real income per household fell by roughly 50 percent (Hyden & Karlstrom, 1993, p. 1399). The urban population suffered most, with an estimated decline in standard of living to the order of 65 percent (Bevan et al., 1988; Bevan, Collier, Gunning, Bigsten, & Horsnell, 1990). While the retail price index of all goods rose by 337 percent from 1969 to 1979, real monthly minimum wages declined by 35 percent during the same period (see Table 3 & 4). Similarly, the retail price index of all goods from 1980 to 1989 rose by 992 percent, but real minimum wages declined by 63 percent during the same period. In the

1990s, however, there has been a slight growth of the economy. Mans (1994) shows that the 1981-86 31 percent average annual inflation rate declined during the economic recovery programs of 1986-1991 to 25.7 percent. And average annual GDP growth in real terms was 4.0 percent.

Table 4

Retail Price Index for Dar es Salaam Minimum Wage Earners (T Shs) (1977 = 100)

Year	Food	All Goods	Inflation %
1969	29.00	32.30	-
1970	31.00	33.40	3.48
1971	32.50	34.60	3.83
1972	36.00	38.20	8.63
1973	40.50	41.70	10.40
1974	53.10	54.50	19.55
1975	79.70	90.10	26.05
1976	98.40	98.90	6.91
1977	115.90	115.60	11.63
1978	138.90	135.00	12.18
1979	141.90	141.00	12.93
1980	168.00	165.20	30.22
1981	215.70	215.00	25.65
1982	266.50	262.90	28.93
1983	318.40	325.00	27.07
1984	348.40	381.80	36.13
1985	508.00	559.70	33.28
1986	759.10	787.90	32.43
1987	954.52	997.80	29.95
1988	1,255.40	1,291.80	31.19
1989	1,618.50	1,688.80	25.80

Source: Tanzanian economy: Income distribution and economic growth (pp. 104 and 105) by E. S. Bukuku, Author, 1993, Westport: Praeger.

This deterioration of purchasing power due to inflation is seen in the fact that at the time of independence in 1961, the official exchange rate was eight Tanzanian Shillings to US\$

1. By May 1993, the inflation percentage had reached 29 percent, making the exchange rate go up to 480 T Shs to US\$ 1. Once again, urban incomes were badly eroded, forcing the government to increase the minimum salary to T Shs 6000 (US \$ 12.5) in May 1993. At the exchange rate of T Shs 480 to US\$ 1, this meant that a low income earner only earned US\$ 12.5 per month, which was not enough. This was only a US\$ 0.34 increase from 1961 wages (32 years after independence). A study of health workers in Dar es Salaam found that almost 40 percent of the workers spent their salaries within the first week, and for 90 percent of them, their salaries only lasted two weeks (Kanji, Kilima, & Munishi, 1992).

To everybody's dismay, the annual salary increases sometimes announced during the June/July Government Budget sessions have been used by people like business people, landlords, and bus operators to increase all consumer prices in the urban centres. In 1993, in order to live comfortably, a conservative minimum salary of T Shs 1,600 (US\$ 3.3) per day or T Shs 48,000 (US\$ 100) per month was required (using an exchange rate of T Shs 480 to US\$ 1). This money could be used to buy basic needs, such as food, housing, and clothing. Other expenses incurred by an ordinary urban worker include school fees, school uniforms, bus fares, and contributions to various community activities and services. Koda and Omari (1991) summarize this situation by writing that:

The current global economic crisis has led to deterioration in living conditions of all social classes in rural and urban areas. Erosion of real wages has made the struggle for survival extremely difficult, especially for [low income] urban households (p. 129).

On May 1st, 1987, the President of Tanzania announced the salary increase and said that the government revenue from various taxes and levies in a year could not meet 60 percent

of the government's commitments. He assured the people that the economic difficulties which had started six years earlier had driven the nation into debt because it was spending more than it was earning. The President, therefore, encouraged workers to start farms, gardens, and rearing cattle to supplement their income ("Economic hardship," 1987).

### THE CITY OF DAR ES SALAAM

This section discusses the City of Dar es Salaam and its economic patterns. First, the history and pattern of urban development is discussed. Second, a presentation is given of two modes of economies: the formal or modern sector which is organized, and the informal sector which is not organized and has been expanding.

#### The History and Patterns of Urban Development

In 1992, the city area was estimated to cover about 1,393 square kilometres (Kombe, 1994, p. 25). Dar es Salaam had a population of 1.3 million people in 1988 (United Republic of Tanzania, 1990b) and 2.2 million in 1992 (Synge, 1992). The population of Dar es Salaam appears to double every decade. It is estimated that by the year 2000, it will have a population of 3.5 million people (Banyikwa, 1988; World Commission on Environmental Development, 1987; van Huyck, 1992). According to Kalabamu (1992), if present trends continue, urban centres in Tanzania will have between eight and 16 million people, or 24-45 percent of the national population, at the beginning of the 21st century. This rapid growth

is caused by the natural increase in urban and rural populations, annexing of peri-urban villages into built-up areas and increasing rural-urban migration.

Dar es Salaam is the biggest urban agglomeration in the country and the most dynamic socioeconomically, culturally, and geopolitically. The city lies 10 metres above sea level and is located around latitude 7° 0" North and 39° 0" East (see Figure 1). The city was the capital until 1973, when Dodoma, which is centrally located in the arid region, began to be developed as the future capital. However, no efforts since then have been made to move the capital to Dodoma, and Dar es Salaam, covering 1,500 square kilometres, is preferred by the government and commercial enterprises as their seat, making it the "hidden" capital of Tanzania. Administratively, modern Dar es Salaam is a district and a region comprised of the Ilala, Kinondoni and Temeke districts. These districts are divided into 50 wards, of which 35 are classified as urban. There are 15 urban wards in Ilala, 11 in Kinondoni and nine in Temeke. The Dar es Salaam City Council (DCC) is responsible for the administration of the city.

Six years after its inception in 1891, Dar es Salaam had 900 inhabitants covering a small area to the south-eastern part of the present Central Business District (CBD). Colonial activity, initially by Germany and later by Britain, established land use patterns in Dar es Salaam. Public and residential buildings were built along the present Samora Machel Avenue, Azania front, and the current north-eastern side of the town. As of 1916, most of the town was confined to the southern section, between Msimbazi creek and the harbour. Colonial rule assured that well-paid and skilled jobs were the monopoly of alien workers. This increased the interdependence of skilled and professionally qualified people in Dar es

Salaam. In 1918, for example, 18 percent of all Europeans and 11 percent of all Asians in the country resided in Dar es Salaam. The area to the east and north-east of the town was apportioned for government offices and European residences. The Asian business people reserved a section closest to the lanes and streets for commerce, while the areas behind served as living quarters. Meanwhile, the Kariakoo and Ilala high density areas were left for the Africans. By the 1940s, the future growth of Dar es Salaam based on socioeconomic differentiation and racial segregation was initiated. As of 1945, the African areas spilled over into Ilala, the Asian area extended to Upanga, and the European area went as far north as the Sea View. The outward expansion of Dar es Salaam after the second World War was influenced by a large influx of population, application of road and bridge construction technology, introduction of motor transportation, and the implementation of modern urban planning practices.

Figure 1 shows the modern Dar es Salaam. Commercial, administrative, and residential activities in the city are spread out in a fan-like pattern away from the Indian Ocean. Commercial areas are concentrated along Samora Machel Avenue, India Street, Zanaki Street and the Kariakoo area. Commercial activities which tend to be monopolized by the Asian community are land intensive and have remained in and around the CBD. Heavy industries are located along Pugu Road, in Chang'ombe, Ubungo, Kawe, Kunduchi, Mbagala and Kigamboni (see Figure 1). Light industries are located around the Dar es Salaam Radio Station, Dar es Salaam International Airport, along Pugu Road, and in Vingunguti. Industrial districts are separated from the medium and low-density residential zones. Rigidly segregated zoning of this type encouraged the establishment of squatter settlements around

the industrial district (Banyikwa, 1988; Kaitilla, 1992). Offices of the government, parastatal organizations, private entrepreneurs, diplomatic missions, and international agencies are located in the CBD and Upanga area. Recently, some offices have moved away from the CBD to Kijitonyama, Temeke, Mikocheni, Mwenge, Regent Estates, and Ubungu areas (see Figure 1). Most of the primary and secondary schools, colleges, and institutes are located in the downtown area. So are the three main hospitals in the city: the Muhimbili, Aga Khan, and Ocean Road hospitals. Institutions of higher learning such as the University of Dar es Salaam, the Rwegalulila Institute of Water Resource Development, the Ardhi Institute, and the Social Welfare Training Institute are located in Ubungu and Kijitonyama.

Dar es Salaam is not a planned city in the same sense as a modern city such as Brasilia, Chandigah, or Abuja is (Armstrong, 1987, p. 133). This is exemplified by the city's various plans (four) since its inception in 1891. The literature contains many accounts to indicate how the State has in four decades (1960s to 1990s) failed to survey and develop enough plots for urban development (Kaitilla, 1990, 1992, 1993; Kironde, 1992, 1995; Kombe, 1994; Kulaba, 1989; Rakodi, 1991). This has led to the informal selling of urban land, and the increase of squatter house plots bought by people of all socioeconomic statuses. For example, it is common in Dar es Salaam for a person from the highest or quasi-medium SES to buy a low density plot from another urbanite and build a house in an unsurveyed and undeveloped high or medium density area. In light of this, the groupings of residential areas as discussed below are not absolute, and isolated cases are usually found outside their main groups.

A grouping of the principal residential areas according to densities in Dar es Salaam

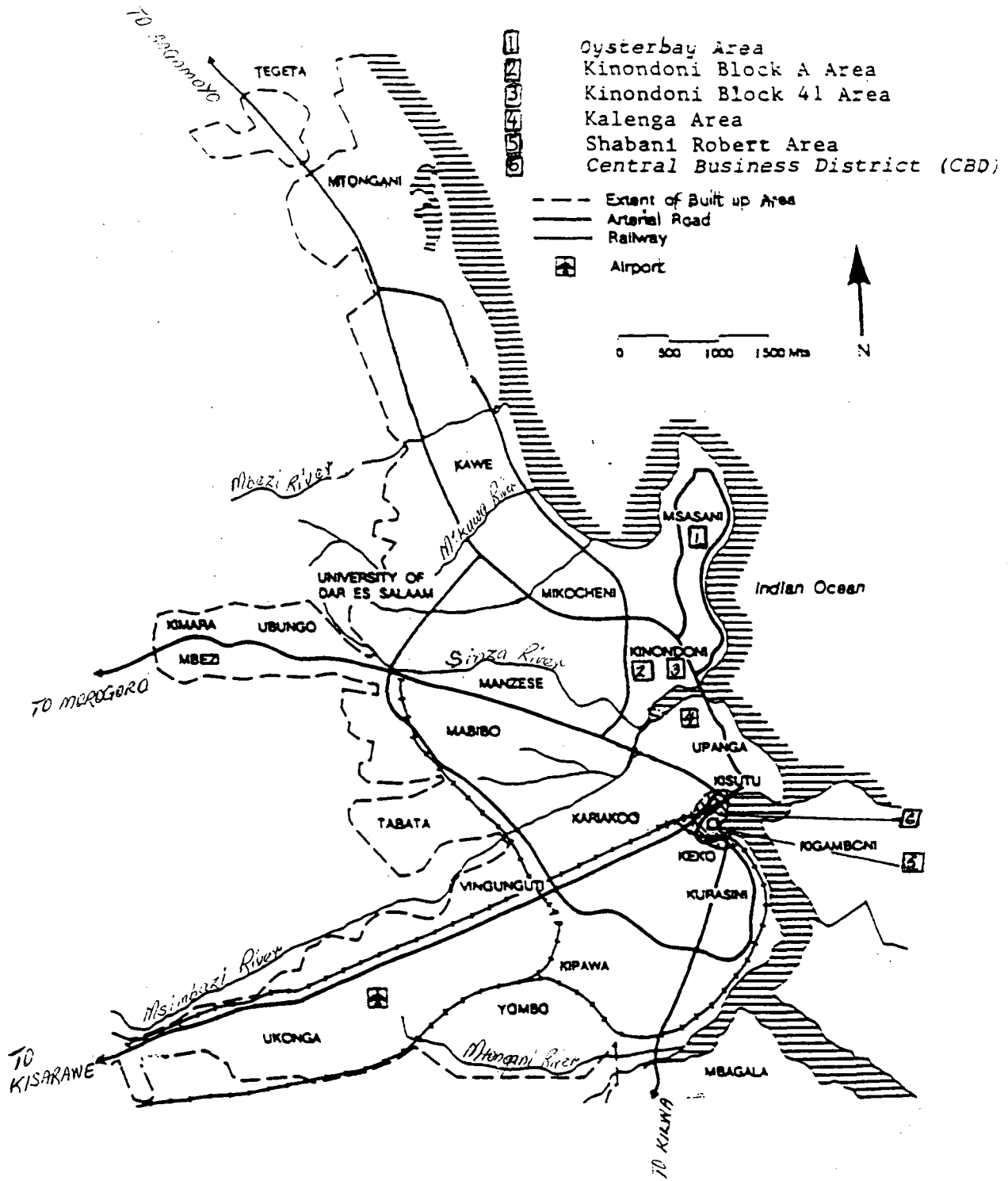


Figure 1. Location of study areas.

Source: Mapping and Surveys Division (1992).

urban wards indicates four distinct groups. (1) The low density areas, with plot sizes typically measuring 4,640 square metres. These areas include Kigamboni, Mbezi Beach, Mikocheni A & B, Mlalakuwa, Msasani, and Oysterbay. (2) The quasi-medium density areas which measure about 1,750 to 2,400 square metres. These areas include Kivukoni, areas around the Kinondoni district survey office, Regent Estate, Upanga, and some areas in Mtoni, Temeke, and Tabata. (3) The medium density areas with plots measuring about 896 square metres comprised of Kinondoni Block 41, Mwnayamala, Ubungo, Tandika, Chang'ombe, and Kimara. (4) The high density areas, which are in the majority, comprised of the areas with plot sizes measuring about 300 square metres. This group includes areas of Buguruni, Ilala, Kariakoo, Manzese, Tabata, Temeke, Magomeni, and Kinondoni. Others include Kawe, Kigogo, Kurasini, Mabibo, Mburahati, Sinza, Vingunguti, Kipawa, Magogoni, Mtoni, and Shimo la Udongo (see Figure 1).

### Economic Patterns in Dar es Salaam

It is useful to distinguish between the formal and informal sectors of Dar es Salaam's economy.

The economy: The formal sector. The formal sector is defined here as an organized activity which is capital intensive using technology and trained human resources, is legalized, and measured in official statistics. This is sometimes referred to as the modern sector. It is made up of people working for the government, the private group, and businesses. The government group contains two kinds of people: those providing services, and those

producing goods. The service group includes people working for the government ministry offices and its various departments. There are those who work for the public institutions such as the Bank of Tanzania, the National Banks of Commerce, and the Cooperative and Rural Development Banks. Other people work for the Tanzanian Harbours Authority, the Registrar of Buildings, the National Housing Corporation, the National Insurance Corporation, and the Tanzania Postal Services Corporation. In 1988, this group consisted of legislators, administrators, and managers and made up only one percent of the urban occupations in the city (United Republic of Tanzania, 1990b). The clerks, however, accounted for four percent of the urban occupations.

Other people in this group work for the public institutions such as the University of Dar es Salaam, colleges and teaching institutes such as the Ardhi Institute, public schools, the Institute of Finance Management, and the Dar es Salaam School of Accountancy. This group also includes physicians and nurses who work for the Muhimbili College of Health Sciences, the Muhimbili Teaching and Consultancy Hospital, and with various clinics and dispensaries in the city. Others include people working for the police and the armed forces. Professionals, technicians, and teachers accounted for eight percent of the urban occupations in the city during the 1988 Tanzania population census.

The production group of government workers includes people working for the public corporations and institutions producing goods for public sale. The industrial sub-group is based on the processing of local commodities and on import substitution. In the city, some industrial goods manufactured include batteries, bottles, cement, footwear, and textiles, some of which are exported to neighbouring countries. Other factories and industries include

those dealing in textiles, breweries, and batteries. The publicly owned industrial group face many problems, such as the rising cost of fuel, lack of foreign exchange to pay for raw materials, spares or equipment, and the frequent interruptions to the water and electrical supplies. Forced by international pressures, trade liberalization, and privatization since 1986, the government sold some factories and industries to private companies and local industrialists, thus increasing job opportunities for the city residents.

What we may call the private group contains those working for the private service group and business group, and those working for the production of goods. With the dwindling ability of the government to create jobs and run its public corporations, more people prefer to work for private companies or institutions. The motivation for people to work for the private group is the higher salaries and fringe benefits they receive from them than from the government jobs. However, some private groups act as an internal brain drain of the low paid civil servants because of this. In the city some people work for embassies, high commission offices, and consulate offices. Still others are employed with the United Nations (UN), the Food and Agriculture Organization (FAO) of the United Nations, and the United Nations Development Project (UNDP). A few people are employed with various Non-Government Organizations (NGOs) to manage their projects. Trade liberalization and privatization created some jobs for the residents of the city in companies dealing with vehicle repair, auto sales, pharmaceutical, farm implements, and industrial tools and equipment. Other people work for the banks, hotels, air transportation, bureaux de change (dealers in foreign currency exchange), the burgeoning private dispensaries, clinics, and a few hospitals such as the Ocean Road Hospital. A few people also work for the veterinary

clinics, which increased proportionately with dairy cattle in the city.

Finally, in the formal sector is the business people group. This is a distinct subset of the private service group in that they are self-employed. The business people living in the city could be further categorized into three subgroups: those of Indo-Pakistani origin, those of Arabic origin, and those of African origin. The 1988 Tanzania population census shows that nine percent of the urban occupations in Dar es Salaam were classified as services, shops, and sales. People with an Indo-Pakistani origin control most of the large capital intensive businesses located in the Central Business District (CBD). Here they operate large businesses, including drapery shops, fleets of vehicles for transportation, hotels, supermarkets, spare parts shops, and taxi cabs. This group is financially strong and often use politicians and government bureaucrats to further their business deals. They do more external trade than the other two groups combined. This group also benefitted from the 1986 trade liberalization process that saw consumer and capital foreign goods imported into the country, often paying little custom's duties. The people of Arabic origin have smaller businesses than those run by the people of Indo-Pakistani origin, and these are located far away from the CBD. Although spread out in many parts of the city, their main concentration is in the Kariakoo area. Since the 1920s, Kariakoo has been a residential and commercial centre for the natives of Dar es Salaam. Its initial planning lay out has not changed much, despite the fact that it is currently experiencing a rapid change to using medium high-rise (five storey) structures (Kaitilla, 1990, p. 211). Most people claim that the money used for capital formation and operating various businesses by the Arab ethnic groups is sent by their relatives living in the oil-rich Arab countries. The preferred

businesses of this group are hotels, small to medium shops, and transportation.

Although people of African origin are in the majority, few operate businesses qualifying them for the status of formal businesses. Most of the formal businesses operated by Africans are found in architecture, accounting, hotel operation, law, and transportation. Most of the people of African origin lack the capital to start a formal business. However, small formal firms operated by Africans are on the rise and through the liberalization process, national banks are urged to loan money to interested individuals. There is a need for the higher Tanzanian learning institutions to strive to produce graduates who are job creators instead of job seekers (Materu, 1993, p. 7). This makes a lot of sense in a country experiencing declining job creation in the traditional government employing sectors. The private production group has become significant since 1986. Since then, individuals and private companies have started a few industries in the city dealing with food processing, machine tools, and yarn. This private group was increasing because of the increased support from the government. People employed in this group include managers, administrators, technologists, professionals, clerks, machine operators, technicians, and janitors.

The economy: The informal sector. The term "informal sector" has been commonly used since the early 1970s, and emanates from studies done in Africa by the International Labour Organization (ILO) (1972) and Hart (1973). The term informal sector . . . has recently gained currency as a tool for understanding the changes under way in the advanced industrial societies (Waldinger & Lapp, 1993, p. 6; Moser, 1984). The ILO report characterized the informal sector as easy to enter, relying on indigenous resources, family

owned enterprises, small scale operations, labour intensive and using adapted technology. It uses skills acquired outside of the formal school system, and is in unregulated and competitive markets. The Tanzania National Informal Sector (TNIS) study (United Republic of Tanzania, 1991) defined the term "informal sector" as

Constituted of urban . . . small scale, self employed, self employed activities, with or without hired labour. Typically operated with low level of organization, low capital, low technology and often on temporary premises. Operators usually are not supported by formal financing institutions, and are not usually measured in official government statistics. (p. 3-7)

The Tanzania National Informal Sector (TNIS) study done in 1991 conducted a comprehensive survey of the national urban and rural informal sector activities in the Tanzanian mainland. It was evident that the Tanzanian economic crisis coupled with a rapid population growth had exacerbated the unemployment situation in the country. The modern or formal sector alone could not be expected to absorb the high annual numbers of new entrants into the labour market. Given the large increases in the labour force compared to the low rate of absorption into the modern or formal sector, it appeared that the informal sector offered the best opportunity for reducing unemployment (United Republic of Tanzania, 1991, p. 1-4).

The informal sector provides basic goods and services which are cheap and therefore appropriate for the majority of low-income earners and are easily accessible to them. In 1989, Aboagye (1989) estimated that the informal sector made up 10.3 percent of the Tanzanian GDP. The economic usefulness of the informal sector has also been underscored by Bagachwa and Ndulu (1988). In 1991, the estimated annual (1991) gross output for the informal sector amounted to T Shs 489.9 billion (US\$ 1 billion at 1993 exchange rates),

which was more than the entire parastatal sector's gross output of T Shs 336.1 billion (US\$ 0.7 billion) in that year (Bagachwa, 1991). He further reported that about six percent of the agriculture and fishing done by the informal sector in the urban areas had a nationwide gross output of T Shs 17 billion (US\$ 4 million). In the city, urban agriculture and fishing contributed about T Shs 64 million to capital formation, that is, the creation of fixed capital such as buildings, physical infrastructure (roads, bridges, etc.), machinery, equipment, and agricultural improvement (e.g., land improvement and livestock) (Bagachwa, 1991).

In Dar es Salaam, the informal sector means an environment in which thousands of urban residents live and work in order to survive. It is nebulous in the sense that its income cannot not be easily defined or its economic output quantified. One of its main characteristics is its low requirement for skills and knowledge. There are three factors which contribute to the increase of the informal sector in the city. The first of these is the growing urban-rural dichotomy. There is a neglect in investing in rural areas in things such as small scale industries, roads, and other amenities. These combined factors make village life undesirable and in many cases intolerable, and further assist the net result of having impoverished villagers flock to the urban areas. The second factor is the simplicity and lack of capital investment this sector requires. Most people who peddle food items and clothes need few skills and little knowledge. The third factor is the failure of the government and the private sector to meet the material and financial requirements for the sustained growth of the formal sector.

Those working in the informal sector can be divided into two groups: classical producers and quasi-informal producers. The classical producers are more numerous and tend to be

more versatile and inventive, offering a bewildering assortment of merchandise and services, mainly to their peer group in the lower social strata. In the city, the typical examples of this group include urban agriculture activities of keeping livestock and growing crops (see Table 5). There are people buying milk, eggs and vegetables from agriculturalists and retailing them to the public. Others are selling seedlings of citrus and palm trees, pineapple setts, and tubers of plantains and banana at the junction of the Morogoro and Mandela roads. Non agricultural classical informal producers include scavengers, shoe shiners, herbalists, food and vegetable vendors, kiosk operators, carpenters, blacksmiths, clothiers, and auto mechanics in open garages (see Table 5). Most women are also engaged in peddling activities such as selling food items and are called "mama nitilie" (the woman who cook and fry) in Swahili (see Table 5). Other activities in the classical informal sector include people hawking buns, doughnuts, cigarettes, and sodas. There are people who sell fried eggs and chips along roadsides, on the beaches, in parks, school grounds, hospitals, and in college compounds. Still others are shoe shiners, watch repairers, auto repairers, carpenters, plumbers, builders, and fishmongers (see Table 5).

The quasi-informal sector is smaller and operated in an environment of orderliness where there is an attempt to adhere to established norms and standards in the course of producing goods. The adjective "quasi" signify that they are on the border between the informal and the formal sector. These people have a semblance of formal education or training and are sometimes found within this sector as a strategy to challenge the prevailing unemployment that exists up to the graduate level (Kivumbi, 1993). These people often produce better quality goods than the prevailing informal sector and some are sold outside the country. In

the city, typical urban agriculture representatives of this class include various institutions such as *Shirika la Uchumi na Kilimo la Taifa (SUKITA)*, an economic corporation of the ruling party, *Chama cha Mapinduzi (CCM)*. Other non agricultural quasi-informal groups include the Ubungo Farm Implements, Small Industries Development Organization, and Parlay (see Table 5). For example, these industries have no statutory or legal protection from the government. And they have also been regarded as polluters of the urban environment by emitting effluent from their operations (Ezaza, 1990; Mashauri & Mayo, 1989; Mayo & Mashauri, 1992; Meghji, 1989; Yhdego, 1992a, 1992b).

If the formal or modern sector in Dar es Salaam (mostly that of the government) is ailing, it seems that the informal sector is vibrant, mainly because of the broad scope of its activities (see Table 5). As long as the Tanzanian economy remains in a distressing state, the informal sector is bound to be an integral part of the lives of most urban residents. Table 5 below shows enterprises in Dar es Salaam which make up the informal sector. However, policy makers' perception of the informal sector has been indifferent. By the end of 1993, the Dar es Salaam City Council viewed most activities carried out by the classical informal sector as an embarrassment. Thus, raids by the police on food vendors, open garages, and vegetable sellers had systematically increased, and this affected the people's source of income.

Table 5

Dar es Salaam's 1991 Informal Sector Enterprises and Their Percentages

Enterprise group	Enterprise	No. of enterprises	%
<u>Agric &amp; Fishing:</u>	Urban agriculture	10,228	5
	Fishing	1,582	1
<u>Manufacturing:</u>	Food processing	4,747	2
	Cloth making	11,441	5
	Mats and Fibre	4,978	2
	Wood products	7,322	4
	Clay products	19	0
	Metal products	1,446	1
	Other manufacture	1,503	1
<u>Construction:</u>	House building	2,003	1
	Masonry	5,430	3
	Other construction	3,329	2
<u>Trade/Rest/Hotel:</u>	Duka general	14,583	7
	Cooked food sale	36,136	17
	Fruit/vegetable sale	16,458	8
	Fish/meat sale	11,286	5
	Food uncooked	12,721	6
	Local beer sale	6,670	3
	Charcoal sale	12,444	6
	Rest/Food stalls	20,070	10
	Other Sale/Trading	11,673	6
<u>Transportation:</u>	Bus & Taxi	1,120	1
	Other Transportation	1,194	1
<u>Community &amp; Personal Services:</u>	Shoe repair	678	0
	Electrical repair	980	0
	Vehicle repair	2,908	2
	Traditional medicines	2,254	2
	Other services	6,019	3
<b>Total</b>		<b>21,1142</b>	<b>100</b>

Source: United Republic of Tanzania, Tanzania national informal sector (TNIS) 1991, Table 4.2, p. 1-23.

## SUMMARY

The human history of Tanzania began about 10,000 years ago, when the Khoisan-speaking hunters and gatherers settled along the eastern Rift to the south of Olduvai. They were later joined by new arrivals of Cushitic-speaking people from southern Ethiopia, who migrated through the eastern Rift. By the first millennium A.D., a much larger influx was beginning from the west, composed of Bantu-speaking peoples who probably originated in southern Nigeria and Cameroon, settled in Tanzania. In 1885, Tanganyika became a German colony and in 1920 a British protectorate. It attained its independence from the British in 1961, and in 1964 formed a union with Zanzibar adopting the name Tanzania. Nyerere was Tanzania's first president. His Arusha Declaration envisioned the cultivation of an ethos of socialism and self-reliance. However, Nyerere's ideas and the aims of the declaration could not be achieved because of the inherent poverty of Tanzania.

Tanzania's economy depends on the export of agricultural crops mainly produced by peasant farmers. The volume and value of these crops have been decreasing, affecting the economy of the country. At the same time the country has been paying high prices for its vital imports. These conditions have partly contributed to persistent high inflation in the country which has decreased the real per capita income of urbanites. Dar es Salaam, being the biggest city in the country, is attracting most people from rural areas. Most of these people are unable to find salaried jobs in the ailing modern sector, and are thus becoming increasingly engaged in the informal sector. Here, they join other urbanites who started a

wide variety of informal businesses to subsidize their incomes because of the inflationary conditions of the country.

## CHAPTER 3

### THE PHENOMENON OF URBAN AGRICULTURE

This chapter describes the phenomenon of urban agriculture. Urban agriculture was an idea prominent in North America in the 1960s and adopted by Tanzania as a way to make money and deal with profound food shortages. It is the practice of food production within the urban and peri-urban areas (Yeung, 1987, 1988). It includes the cultivation of crops, fruits and vegetables, trees, gardens, and orchards. It includes also animal husbandry, fuel wood plantation, aquaculture, and related activities (Ganapathy 1983 quoted by Yeung, 1987). Urban agriculture is a diverse, omnipresent, thriving, and profitable activity in cities all over the low-income and the high income world (Smit & Ratta, 1992, p. 7). The term urban agriculture has been adopted by most researchers (Bills, 1991; Deelstra, 1987; Freeman, 1991; Gutman, 1987; Kleer, 1987; Maxwell & Zziwa, 1992; Mvena, Lupanga, & Mlozi, 1991; Sacks & Silk, 1987; Sawio, 1993, 1994) and the term "urban farming" (Diallo, 1993; Drakakis-Smith, 1992; Gefu, 1992) has also been used. In the Tanzanian context, urban agriculture is the rearing of animals (dairy cattle, poultry, pigs, goats) and the growing of vegetables and field crops (maize, cassava, legumes, plantains). All these activities occur in urban areas as designated by the United Republic of Tanzania under the Town and Country Planning Ordinance CAP. 378 of 1956 revised in 1961. Urban agriculture might seem like a nightmare to people in the West accustomed to well-trimmed lawns and tidy backyards. However, by the 1990s, to Tanzanian people of all classes, urban agriculture had become an essential source of food and income. It had also become a place for

socio-technological innovation and an arena for developing new confidence in tackling other problems. For low status Tanzanians it also appears to represent an opportunity for "advancement" - if they can get the required food, animals, seed, and land. In a similar vein, O'Connor (1983) perceived urban agriculture to be an important part of small-scale enterprises. However, these activities do have disadvantages, chief among which is that they cause environmental degradation that concerns most people, city councils, and governments.

Section one deals with urban agriculture and its benefits. It examines the phenomenon in various regions: Asia, Europe, South America, the U.S.A., Canada, Africa, Tanzania and Dar es Salaam, and it provides a summary review of the benefits of urban agriculture. In the second part of the chapter, the primary disadvantage of urban agriculture, that is, environmental degradation, is examined. This section analyzes environmental degradation in Dar es Salaam by examining two main activities: livestock keeping and crop growing. Section three looks at the role of governments and governmental agencies in urban agriculture in the city. Finally, a brief section summarizes the chapter.

## URBAN AGRICULTURE AND ITS BENEFITS

This section discusses urban agriculture in its global context. The experiences of non African nations are discussed in a first sub-section. A second sub-section deals more particularly with the situation in Africa and specifically in Tanzania and Dar es Salaam. A final sub-section reviews the advantages of urban agriculture.

### Urban Agriculture in its Global Context

"Urban gardens" have existed in many places, but were mainly for aesthetic purposes, hence the term "gardens of pleasure" (Encyclopedia Britannica, 1979, pp. 893-900). In 1400 B.C. there were the Egyptian gardens, and in 4-5 B.C. there were the famous Byzantine gardens of Greece. The renaissance gardens of Italy between the 13th and 15th centuries produced the 20th century gardens, called the *giardini segreti* in Italy and the *compartiments de broderie* in France. These gardens evolved into *le jardin anglais* that flourished in the small town gardens of Europe, and was later introduced to the colonies. Simultaneously, similar gardens existed in China, India and Japan called the *Saiho-ji*. The practice of producing food in cities dates from Incaic, Aztec and Mayan cities, early Javanese and Indus settlements, and towns of the Tigris and Euphrates (Mougeot, 1993, p. 2). At this time, African towns too had gardens although not as sophisticated as those found in Europe and other places.

Today, urban agriculture is being done with varying degrees of success (Wade, 1987, p. 29). Wade says that there are three conditions affecting most developing countries that point to the need for urban food self-reliance programmes. First is a growing dependence on food and fuel imports. Second is the increase in population of most of the poor urban dwellers. And, third is a declining ability to supply their inhabitants' food requirements through domestic production. In most developing nations, low income people are facing a great increase in food prices. Surveys from the late 1980s in Bolivia, Egypt, Kenya, India, Mali, Thailand, Tanzania and Uganda show that poor urban households spent around 60 percent--and in some cases as much as 89 percent--of their income on food. In 1990,

households in nearly half the Least Developed Countries' (LDC) largest cities were spending 50-80 percent of their average income on food (Ethelston, 1992; Population Crisis Committee, 1990). In a United Nations Development Programme (UNDP) report on 18 countries in Asia, Africa and Latin America, it was pointed out that urban agriculture was practised mostly by enterprising urban dwellers and organizations (Smit & Ratta, 1992, p. 7). One to three quarters of urban families in these countries were engaged in some form of food or fuel agriculture - either full or part time. The UNDP report gave statistics such as: 66 percent of the urban families in Kenya and Tanzania, 80 percent in Kinshasa, Zaire, 25 percent in the USA, 65 percent in Moscow, the Soviet Union, and 60 percent in Taiwan. In most countries, urban agriculture is done by the poor, and mostly by women.

Urban agriculture frequently moves ahead despite the best intentions of planning officials bent on "modernizing" their city by removing vestiges of backward activities (Wade, p. 29). In the developing world, urban agriculture has been expanding since the 1970s because of rapid urbanization and ineffective agricultural policies. Other causes are poor food distribution systems, lack of subsidies, declining salaries and wages. Still, others are inflation, unemployment, lax urban regulations, civil strife, the availability of open spaces, and droughts. In some towns and cities, food production by citizens has become extensive. "You have only to take a walk through Manila, Dar es Salaam, or Rome and will see green areas where food and fuel are being farmed in the urban and peri-urban regions. Others are on vacant plots, along roads and streams, including unbuilt areas, on public lands, in backyards, on rooftops, and in bodies of water" (Smit & Ratta, 1992). This agriculture has been found to "convert urban waste and idle land into jobs and health while improving the

environment for living, strengthening the economy, reducing the cost of running the city, and conserving energy" (Hartvelt & Gross, 1992, p. 1).

In Asia, where most urban growth is concentrated in metropolitan areas, the problem of food availability and access is becoming more acute (Yeung, 1987, p. 14, 1993, p. 6). Most residents in Asian cities, therefore, strive to produce their own food. Yeung found that in six Chinese cities, well over 85 percent of the vegetables consumed by the urban populations was produced within the bounds of the municipality. In Guangzhou, China, up to nine crops a year are grown sequentially on a single field (Yeung, 1988, p. 16). In Karachi, Pakistan, where rains are never heavy and fluctuate widely from one year to another, the people take advantage of dry river valleys to produce half the city's fresh vegetables (Smit, 1980). It appears that urban agriculture in most Asian countries has been practised for a long time. In India, the high productivity in small and marginal spaces is well documented. In Calcutta, India, "garbage gardens" thrive on that city's mostly degradable waste, which is painstakingly sorted by thousands of garbage pickers (Sachs & Silk, 1987). In Katmandu, Nepal, urban household production meets almost one third of the fruit and vegetable needs of the city (Zurick, 1983; Wade, 1981).

In other parts of Asia, urban agriculture is also ubiquitous. In Suva, Fiji, approximately 50 per cent of the land of a 30 square kilometre peninsula where the capital is located is estimated to be under community cultivation (Wade, 1987). Urban agriculture in some Asian countries is also done by people without formal employment who derive their livelihoods from it. In Taiwan, for example, where half the population is urban, over half the families farm (Hartvelt & Gross, 1992). A UNDP report pointed out that a 1980s

government land use survey of Greater Bangkok, Thailand, showed that 60 percent of the land was being farmed. Many Asian countries, have been promoting home gardening where success has varied (Latz, 1991; Mougeot, 1994; Yeung, 1987, 1993). These countries include Japan, Philippines, South Korea, Malaysia, Indonesia, Thailand, Sri Lanka, and Bangladesh, among others.

Urban agriculture is also done in countries like Poland, Holland, Bolivia, and Italy. All have thriving urban agriculture enterprises and are exporting their crops, technology, and specialized equipment (Hartvelt & Gross, 1992). In 1983, in England there were a million home gardens and Germany had 500,000 (Duet 1983 quoted by Gutman, 1987). In Poland, urban areas produced about 46 percent of the vegetables and potatoes consumed in cities (Kleer, 1987). Kleer also maintains that in the mid-1980s, the urban allotment gardens involved the cultivation of some 402,000 hectares of farmland, which represented 2.1 percent of the country's agricultural area. Some 2.7 million families were involved, which represented over one-fourth of the country's population.

In South America, urban agriculture is an opportunity for the beleaguered urban poor. In Brazil several cities have started urban agriculture projects. In the 1980s the same thing was happening in the shanty towns of Santiago, Chile and elsewhere in Latin America (Deelstra, 1987; Sachs, 1985). In some large Latin American centres, a third of the demand for vegetables is met by urban production (Wade, 1987). For example, a project using hydroponics was established in the poor area of Ecatepec with its saline soils in the city of Mexico. Wade maintains that this was entirely for money. Low-income, illiterate women in Bogota, Colombia, earned two to three times as much from growing hydroponic

vegetables as their husbands made from semi-skilled jobs (Hartvelt & Gross, 1992, p. 1). In La Paz, Bolivia, urban farmers produce about 3.4 percent of the region's food needs and the activity is increasingly becoming significant (Bohrt, 1993, p. 20). This urban farming is primarily done by women and is a survival strategy in Bolivia, a country with a chronic and growing food shortage. In Colombia and Peru, there are increasing numbers of city gardens *por coger* (family consumption needs), and most women raise chickens and pigs for consumption (Lee-Smith & Trujillo, 1992, p. 77). Gutman's (1987) study of urban gardening in the districts of Greater Buenos Aires, Argentina found that a hundred square metres intensively cultivated could supply the vegetables needed for a family of five persons.

In the United States of America, urban agriculture was also encouraged through the *greenbelt towns* of 1935-1938 (Christensen, 1986), based on Ebenezer Howard's idea of 1898 (Osborn, 1965). His idea was to have towns and gardens co-exist, where urbanites could go to farm. Many *garden cities* and *green towns* failed because of socioeconomic, political, and managerial factors. Later came the 1960s "back to the land" movement, which saw "hippies" start gardens in cities. In the West, there has been considerable concern about the extent to which "hobby farms" consume arable land near the cities. These farms are usually owned by upper-class professionals who want a rural lifestyle, but need to stay in touch with jobs, friends, or cultural events in the city. Berry (1978), Bills (1991), Luzar (1988), and many others have examined strategies to stop land from being taken over by cities. According to Lockeretz, Freegood and Coon (1986), in the United States, people appreciated farms near cities for their aesthetic, and for the environmental value of open spaces, and wildlife habitat. Consumers also had an interest in getting fresh produce. Food production in small

spaces has also been significant. For example, surprisingly high yields were obtained in model small-scale home gardens developed in California and Hawaii in 1978 (Wade, 1987, p. 29). In November 1992, the author saw vegetable "farms" across the street from the famous American Disneyland, in Anaheim, near Los Angeles. In the U.S.A., upper-class people mostly do urban agriculture. The concern has been to stop land from being taken over by city expansions. In Canada, the author has observed that urban agriculture exists in the metropolis of Greater Vancouver. Urbanites tend to have two prominent kinds of gardens: the household and community. Usually, people owning houses have household gardens that range from 20 to 40 square metres in which they grow vegetables such as tomatoes, trailing beans, carrots, lettuce, bok choy, spinach, and beet roots. On the other hand, urbanites who live in rented apartments acquire plots in community gardens (Burnaby, Cottonwood, Maple, Pleasant Neighbourhood, Strathcona) that range from six to 50 square metres, and they grow vegetables, herbs, and flowers. In Vancouver, evidence also suggests that other people practice urban agriculture on balconies and backyards.

### Urban Agriculture in Africa

People in African towns and cities have undertaken urban agriculture in varying degrees and forms since the modern towns and cities came into existence in the 1900s. Rakodi's (1988a) study, confirmed that the practice was probably as old as the African cities themselves. Current urban agriculture varies from one country to another, depending on the availability of infrastructure, socioeconomic status, and the performances of national economies, among other factors. Perhaps Khouri-Dagher (1986) gives the most dramatic

manifestation of self-production of food where urbanites in Cairo kept livestock fed on domestic refuse on the roof-tops of buildings. In the early 1980s, at least 80,000 households raised animals in this way. Less dramatic, albeit more significant, is the widespread practice across Africa of urban dwellers undertaking some cultivation on small plots for their own consumption and to supplement household income (Rogerson, 1993, p. 38-39).

In West Africa, a farmer survey of 1962 in Ougadougou, Burkina Faso, Skinner (1974) reported 34.4 percent of those questioned could be called cultivators. A similar percentage was found in the 1970s in Yaounde, Cameroon (Fraqueville quoted by Streifeller, 1987). In Buea, Cameroon, Ngwa Nebasina (1987) studied urban gardeners and found that "urban dwellers, including civil servants and their dependants have discovered the small-scale agricultural potentials that urban lands provide" (p. 77). In Ougadougou, Manshard (1992), and Streiffeler found similar results in Cotonou, Bukina Faso, and Dakar, Senegal. Mali's capital, Bamako was self-sufficient in citrus fruits and vegetables, so was Lome, Togo that grew enough vegetables to meet its own needs (Diallo, 1993). He notes that urban agriculture in West African towns and cities was mostly carried out in poor households that were in high-density areas. To a large extent, the women had made it their "business."

In Zaria, Nigeria, Schwerdtfeger (1982) took aerial photographs in 1982 that showed that 66.2 percent of the urban area was cultivated. In Ibadan, Nigeria, 70 percent of the urban agriculturalists were low-income earners with an annual income of less than Nigerian naira 2,000 (US\$ 200) (Gbadegesin, 1991). Here, farming in the urban environment was guided by a requirement for survival--to provide them with basic foods. In Zaria, Nigeria, about 82 percent of 110 surveyed university employees (graduate assistants and professors) had

been doing part-time farming over the past six to 15 years (Gefu, 1992). They grew common crops such as maize and cowpeas that were the staple food items for the population. About 81 percent of the interviewees kept some livestock that included goats, poultry, and sheep, in that order. Gefu concluded that increasingly, part-time farming was being carried out by urban wage earners to supplement their declining wages despite the evident diseconomies of scale and low profit margins. Tricaud (1987) summarized west African urban agriculture as done for economic survival, which has, at the same time transformed the land left over by the urbanization into gardens thus improving its ecology.

In Central Africa, urban agriculture is the occupation of low income people. In Libreville, Republic of the Congo, Lasserre (Lasserre 1958 quoted by Streiffeler, 1987) says in 1975, 80 percent of urban women were reported to cultivate a field. According to Streiffeler, in cities such as Brazzaville in the Congo Republic and Kinshansa, Zaire, small livestock and aquaculture were common, also growing cassava and bananas. In Manono, Zaire, the city had been transformed into a garden city, maintaining its population despite the sharp decline of its tin industry because of a fall in world prices and obsolete equipment. Urban agriculture here was not simply a continuation of the old habits of rural immigrants but had more to do with the difficult economic conditions. In Zaire, notes a UNDP (1990) report, urban agriculture saved thousands of lives when the national economy was in disarray. This was the case, especially for those not employed in the formal economy who earned a meagre income from informal activities.

In Harare, Zimbabwe, Drakakis-Smith (1992) studied urban agriculture in three residential areas: Epworth (squatter settlement), Glen View (a government service site),

and Mabelreign (mixed-middle class). All the crops grown in the urban gardens were consumed or retained within the producer's household. In another study, Mbiba (1994) looks at the institutional responses to uncontrolled urban cultivation in Harare. Other researchers in Harare have documented the importance of urban gardens in reducing hunger and poverty among the poor (Drakakis-Smith, 1991; Drakakis-Smith & Kivell, 1990; Drakakis-Smith, Bowyer-Bower & Tevera, 1995) and its expansion since the 1970s, especially in the peri-urban areas (Mazambani, 1982, 1986; Zinyama, 1989). In the 1980s, in Lusaka, Zambia, about 60 percent of low-income households did some form of cultivation (Sanyal, 1985, 1986). Most farmed because of economic hardship. Rakodi's (1988a) study in Lusaka, Zambia confirmed Sanyal's studies, although her study focuses on women. She noted, as did Sanyal, that produce was consumed within the producer's household, and little was sold. In Lilongwe, Malawi, low income people do urban agriculture for food (Potts, 1989), and is also so in South Africa (May & Rogerson, 1995; Rogerson, 1993). In Mozambique and Uganda, notes a UNDP report (Hartvelt & Gross, 1992), urban agriculture grew rapidly and was essential in feeding their urban populations during the civil wars. As seen in other African countries, low income people also do urban agriculture in central African towns and cities.

As in most towns and cities in Africa, urban agriculture in north eastern Africa, was also common. In Addis Ababa, Ethiopia, it was traditional for cows, sheep, chickens, maize, and other vegetables to be found in the urban environment (Egziabher, 1993, 1994). Community-administered *kebele* lands are divided into plots and allocated to the poor and unemployed for cultivation (Wayburn, 1985, p. 6). For most, growing vegetables was their

only means of survival, especially in a city where about 60 percent of the people were low-income earners, earning about 200 Birr per month (US\$ 40 in 1984). In East Africa (Kenya, Tanzania, Uganda), urban agriculture is omnipresent as well. In Kenya it is an important coping strategy for 77 per cent of the urban poor, many of whom say they would starve if they were not farming (Lamba, 1993, p. 17). In 1985, the Mazingira Institute carried out a nation-wide urban agriculture interview survey involving more than 1,500 households in Nairobi and five other towns. The survey found that 62 percent of the households grew part of their food; 29 percent grew it in the urban areas where they lived, and 17 percent kept livestock within the city (Lee-Smith, Manundu, Lamba, & Gathuru, 1987, p. xv; Lee-Smith & Memon, 1994; Memon & Lee-Smith, 1993). The Mazingira study documented the fact that most of the operators were women (56 percent). They summarized their study results by saying that crop growing and livestock keeping were wide-spread in Kenyan towns and cities. The researchers estimated that the crops produced amounted to about 25.2 million kilogrammes valued at US\$ 4 million (Stren, White & Whitney, 1992, p. 545). Urban agriculture in most Kenyan towns and cities is mostly done by people of low income groups. Urban agricultural production in the city of Nairobi and its surroundings consists of subsistence and cash crop cultivation and livestock raising (Freeman, 1991; Obara 1988 quoted by Sawio, 1993). In Kenya, urban cultivation of urban lands is a palliative for the poor and the landless unemployed who hold low-paying or *jua kali* jobs (Lado, 1990). It is also an important source of supplementary food and is an income generator for the female-headed households. Similarly, Freeman (1991, 1993) found that about 70 percent of all the respondents of low income people practised subsistence cultivation.

Results of people doing urban agriculture in Kenya, appear similar to those found in 1989, in Kampala, Uganda. About 91.3 percent of 98 respondents said that they started urban farming because they needed food (Maxwell & Zziwa, 1992, 1993). In Kampala, urban agriculture was a significant component of the survival strategy of middle and lower-income households, a strategy that developed during the harsh economic circumstances that had befallen Kampala twenty years earlier. Participation was also attributed to cultural and economic causes (Oloya 1988 quoted by Maxwell & Zziwa), and Mwesigwa's (Mwesigwa 1987 quoted by Maxwell & Zziwa) study in Kampala, ranked urban agriculture as a productive activity in the informal sector of the city.

Urban agriculture in Tanzania is widely done by people of different socioeconomic status. The poor urban households in most Tanzanian towns and cities meet about 33 percent of their food needs through urban agriculture (Sanyal, 1986). Mvena et al. (1991) conducted an extensive field questionnaire survey of five cities and towns in Tanzania located in five different climatic zones. This study used agriculture/livestock extension workers to collect data. The towns and cities involved were Dar es Salaam, Dodoma, Kilosa, Makambako, Mbeya, and Morogoro. Of 1,782 respondents in a stratified sample, 66 percent were men and 34 percent were women. About 92 percent of the respondents surveyed showed that most of the revenue received from livestock and crop enterprises supplemented the meagre salaries received from their employers. About 68 percent of the respondents kept at least one form of livestock in their households. The most common types of animals were dairy cows, goats, sheep, pigs, rabbits, and guinea pigs. Other animals were exotic chickens, which included broilers and laying hens. Urban people also kept local chickens, pigeons, and

guinea fowls. To underscore all this, Mosha (1991) writes that:

Urban agriculture is widespread in low density areas, like Oysterbay in Dar es Salaam, Raskazone in Tanga, Mlimani in Dodoma and Isamilo in Mwanza. A random survey showed a range of 2 to 50 head of cattle, 1 to 25 goats, 5 to 100 pigs and 100 to 3,000 chickens (p. 83).

### Urban Agriculture in the City of Dar es Salaam

In Dar es Salaam, Tanzania, Vorlaufer (Vorlaufer 1973 quoted by Streiffeler, 1987), observed that 18.6 percent of the households in 1967 did agriculture. In Buguruni and Manzese wards, about 40 percent of the low income people who left formal employment in the 1980s went into urban farming (Tripp, 1990). As time went on, urban agriculture in Dar es Salaam changed to include people of high, quasi-medium and medium SES. Tripp notes that "urban farming after the 1970s was markedly different from the small garden plots that had characterized much of the urban agriculture in the city up to this time" (p. 70). Sawio's (1993) study of 260 non random urban agriculturalists in three wards in Kinondoni district, Dar es Salaam is also relevant. The study examined urban agriculture and land-use changes in the city. About 49 percent of the respondents said that urban agriculture directly provided them with between 20 and 30 percent of their household food (subsistence) supply. About 67 percent of the respondents said that these activities gave them an income that was greater than their regular salaries. Practitioners also included better off households, and contributed to their household food supply. Generally, urban agriculture activities in the city have increased greatly in recent years, a trend that worries the City Council. For example, Sawio (1993) found that in the city in 1980, 44 percent of low-income earners had

farms, but by 1987, 70 percent of the heads of households were engaged in some farming or livestock husbandry. In Dar es Salaam, most physicians engaged in agricultural production or animal husbandry to supplement their income (Tripp, 1990). In the low density areas of Oysterbay in the city, at least 90 percent of the government and ruling party officials living in government houses kept an average of eight dairy cattle each (Mvena et al., 1991).

In 1990/91, in the city's urban areas, 55 percent of the households were engaged in informal sector activities at some time (Kidehele, 1991, p. 1-71). Out of 315,958 people employed in the informal sector, 17,866 (5.7 percent) worked in urban agriculture (growing crops, keeping livestock) (Madihi, 1991; Nyambaya, 1991) (see Table 7). The 1988 Tanzanian population census for Dar es Salaam's urban areas also show that 5.7 percent of the respondents were cultivators, 0.9 percent were mixed farmers, and less than 1 percent (0.3) were agriculture workers by occupation. In 1991, urban agriculture in the city represented 5 percent of the informal sector enterprises (United Republic of Tanzania, 1991) (see Table 5). Eight percent of the operators in the informal sector in the city were found in urban agriculture providing employment to 18.5 percent of the people (Ngoi, 1991). In 1991, Ngoi shows that there were 10,228 urban agriculture enterprises. Some of those enterprises would have been of crops, but most would have been of dairy cattle, a kind of farming that since 1985 had tremendously increased, a trend illustrated in Table 6.

Income earned from urban agriculture enterprises leads most people to increase their operations. In 1991, the average annual revenue from urban agriculture in the city was T Shs 241,300 [US\$ 965.2] while profit was T Shs 115,000 [US\$ 460.0] (Nyambaya, 1991) (see

Table 7). This was 1.6 times more than from an annual income of a minimum salary of T Shs 72,000 [US\$ 288.0]. Furthermore, in 1991, in the city, 10,228 urban agriculture enterprises realized an annual gross output of T Shs 6.8 billion [US \$27.4 million] (see Table 7). The annual value added was T Shs 2.8 billion [US \$11.3 million], the average gross output at T Shs 583 billion [US \$2.3 billion], and the average value added was T Shs 239 billion [US \$956 million]. These figures suggest that urban agriculture as an informal sector in the city is not necessarily a marginalized sector as other studies show (Freeman, 1991, 1993; Maxwell & Zziwa, 1992, 1993; Memon & Lee-Smith, 1993).

Other studies of urban agriculture done in the city include those of Bongole (1988), Shauri (1989), and Tukaye (1990). All studies point to the fact that urban agriculture is an important source of money and food. Mans (1994) writes that "in urban centers, economic growth and the explosion of informal sector business activities have improved income and consumption" (pp. 407-408). Since the mid 1980s, during the policy of liberalization, several small businesses have sprung up, operated by individuals and groups of people (the informal sector) who support urban agriculture. Government veterinary officers started private animal clinics, and wealthy individuals opened stores selling farm supplies, animal feed, and animal feed "mixing houses." Individuals, especially young women, bring in chicks for eggs production and broiler meat from Zambia and sell them in the city. Male unemployed urbanites gather forage from distant fields and sell it to city dairy cattle keepers. There is also a booming industry for selling maize bran, *dagaa* (sardines), beans, grain maize, and other concentrates that are used in creating animal feed compounds. These, however, are only part of the benefits of urban agriculture.

Table 6

Livestock Numbers in Dar es Salaam From 1985 to 1993\*

Year	Dairy cattle	Poultry					Goats
		Layers	Broilers	Local fowls	Ducks	Pigs	
1985	3,318 (21) <sup>a</sup>	221,920 (24)	146,205 (19)	88,720 (5)	4,900 (28)	6,795 (21)	1,361 (48)
1986	4,200 (20)	292,000 (25)	180,500 (7)	93,389 (5)	6,800 (16)	8,601 (18)	2,617 (31)
1987	5,278 (26)	390,000 (12)	194,500 (18)	98,304 (5)	8,100 (23)	10,454 (22)	3,820 (34)
1988	7,105 (17)	445,000 (19)	237,000 (16)	103,341 (5)	10,449 (23)	13,383 (15)	5,764 (32)
1989	8,597 (17)	551,800 (16)	282,083 (16)	108,508 (5)	13,479 (23)	15,658 (17)	8,531 (32)
1990	10,402 (17)	664,232 (19)	335,624 (16)	113,933 (5)	17,388 (23)	18,946 (17)	12,626 (32)
1991	12,586 (17)	824,448 (20)	399,393 (16)	119,630 (5)	22,431 (23)	22,925 (17)	18,686 (32)
1992	15,229 (17)	1,027,275 (19)	475,276 (16)	125,611 (5)	28,936 (23)	27,739 (17)	27,655 (32)
1993	18,286	1,225,392	565,579	131,891	37,327	33,564	40,930
% a.i. <sup>b</sup>	(19)	(19)	(16)	(5)	(23)	(18)	(34)
% ('85-93) <sup>c</sup>	451	452	287	49	662	394	2,907

Source: \*Data were gathered from the three Dar es Salaam veterinary district offices (Ilala, Kinondoni, Temeke) and from the Dar es Salaam City Council livestock office. <sup>a</sup>Number in brackets indicates the percent change of livestock numbers in a year. <sup>b</sup>a.i. denotes the average percent increase of livestock for the eight years (1985-1993). <sup>c</sup>Denotes the percent increase in livestock numbers from that of 1985 to 1993.

Table 7

Dar es Salaam's 1991 Employees in Urban Agriculture, Other Enterprises and Their Earnings (T Shs)

	Urban agriculture	Other 30 enterprises	Total
<u>Employees:</u> Total employed	17,866	298,092	315,958
Male employees	9,953	181,018	190,971
Female employees	7,913	117,074	124,987
<u>Occupations (operators)</u>			
Male operators		104,418	104,418
Female operators		86,052	86,052
Male - Crop farmers	1,426	-	1,426
Male - Livestock farmers	1,135	-	1,135
Female - Crop farmers	2,067	-	2,067
Female - Livestock farmers	3,536	-	3,536
Total enterprises	10,228	200,914	211,142
% of the total	5	95	100
Average annual input (T Shs)	35,200 (US\$ 141.0)	30,500	-
Average annual revenue (T Shs)	241,300 (US\$ 962.2)	266,300	-
Average annual profit (T Shs)	115,000 (US\$ 460.0)	94,900	-
Annual gross output (T Shs)	6.8 billion (US\$ 27.4 million)	131 billion	137 billion
Annual value added (T Shs)	2.8 billion (US\$ 11.3 million)	39 billion	42 billion
Average gross output (T Shs)	580 billion (US\$ 2.3 billion)	652 billion	-
Average value added (T Shs)	238 billion (US\$ 956 million)	200 billion	-

Source: United Republic of Tanzania, Tanzania national informal sector 1991 (TNIS), Government Printers: Dar es Salaam. Tables 2.1.1, p. 1-5; 2.2.2, p. 1-7; 3.1.2, p. 1-15; 4.2, p. 1-23; 4.10, p. 1-37; TOTs 2, p. 2-1; TOT 4, p. 2-1; ENT 3, p. 2-4; OP 3, p. 2-29; and OP 5, p. 2-30.

In the next section is a fuller discussion of what are seen as the benefits.

### The Benefits of Urban Agriculture

Most people do urban agriculture in towns and cities because of its high yield compared to that done in rural areas. Urban agriculture in developing countries in relation to rural agriculture has the following characteristics: high productivity per unit space, low capital per unit production, low energy consumption, low marketing cost, and freshness of the products (Smit, 1980). In the city, open green spaces where amaranths grow would affect the air circulation, temperature, and humidity levels in the city. Urban agriculture offers many advantages to cities from ecological and technical perspectives, especially if the green spaces that result are an integral part of the city (Deelstra, 1987). If they are well managed, cultivated green spaces can reduce soil erosion, disperse noise, and reduce levels of dust in the air, especially that from vehicles. Air quality is also improved by the production of oxygen through photosynthesis, called the hygienic function of the green spaces. Urban planners have called these open spaces urban lungs. Urban agriculture can also contribute to the efficient functioning of waste-water treatment systems and the production of bio-gas. It can reduce the costly and problematic transportation of food from rural areas because it produces food locally. There is also the advantage of using people. This includes the physical labour and special knowledge which people have about caring for crops and livestock. A major advantage of urban agriculture is its potential to improve the socioeconomic conditions of unemployed youth and low income people.

Urban agriculture is the largest and most efficient tool for transforming urban waste into

food and jobs, with by-products like an improved living environment, better public health, energy savings, natural resources savings, land and water savings, and urban management cost reductions (Smit & Nasr, 1992). It makes a contribution to the community and derives economic significance from it in many ways: contributions to aggregate urban productivity, generation of urban employment, provision of a point of entry for females into the entrepreneurial milieu and the urban labour market, filling vacant niches in the supply of goods and services, and valorization of urban wastelands (Freeman, 1991). It can also give the city more sustainable ecosystems by recycling waste - as opposed to simply dumping it into landfills outside the city. Urban agriculture also has the potential to reduce municipal waste management costs. Another obvious advantage is that the poor can feed themselves. The following paragraphs discuss six important benefits of urban agriculture apparent in Dar es Salaam: nutrition, income generation or poverty reduction, community well-being, waste management, and conversion of food items.

Urban agriculture for nutrition. Food produced in the homes enables families in Addis Ababa cooperatives and Dar es Salaam's poor families to save 10 to 20, and 37 percent of their income, respectively (Egziabher, 1993, 1994; Sanyal, 1987). In a 1986 Mazingira survey in Kenya, as many as 40 percent of the urban farmers were found to completely depend on food produced by themselves for nutritional survival. Similarly, about 75 percent of the respondents in Nairobi, Kenya mentioned food as a primary motive for practising urban cultivation (Freeman, 1991). Although Mvena et al. (1991) found that only 38 percent of the 1,782 people surveyed said their primary motive for practising urban agriculture was

nutrition, in Uganda, Maxwell and Zziwa (1993) found that about 91 percent of the people surveyed said that this was their motive. It is also done for nutrition in several other low-income countries (Bohrt, 1993; Diallo, 1993; Gbadegesin, 1991; Gefu, 1992; Gutman, 1987; Memon & Lee-Smith, 1993; Sachs & Silk, 1987; Streiffeler, 1987; Wade, 1987; Yeung, 1987, 1988, 1993), although the statistics may vary. Across the sub-Saharan continent, in Abidjan, recent arrivals from nearby countries are farming on vacant lots and at the roadside for survival (Smit & Ratta, 1992, p. 3). In Dar es Salaam, "urban agriculture is significant by production for the market because it makes a substantial contribution to the supply of fresh milk, meat, eggs, and vegetables" (Sawio, 1993, p. 336).

Urban agriculture for income generation or poverty reduction. For the urban poor who have low or irregular income from other sources, growing food provides income. Another benefit of urban agriculture not widely recorded is the "fungible" income. "Fungibility" is the ability to provide for extra income that can be spent on essentials like health care and education. This is important, especially in cities of the developing countries where over 50 percent of the family expenditure is for food (Ethelston, 1992; Maxwell, 1994; Maxwell & Zziwa, 1992; Population Crisis Committee, 1990; Sanyal, 1986; Sawio, 1993, 1994; Yeung, 1988). Urban agriculture also provides jobs for the poor and income for the marginalized groups such as women, youth, and the older population. Most studies suggest that low income farmers in developing countries do the most urban agriculture. For some, growing their own food is the only way they can survive in the metropolis. In Dar es Salaam, it is common to see field crops growing everywhere, some grow vegetables that they can harvest

regularly to feed their families. Yet others grow field crops and keep a few livestock that enable them to subsist in the city. In this way, urban agriculture decreases poverty and malnutrition for the people.

Urban agriculture for community well-being. Farming in low-income urban communities contributes to the health of the poor by providing healthy, more nutritious food. It also creates a healthier and cleaner living environment through replacing vacant and littered land with green, orderly areas. Low-income neighbourhoods benefit more than the rest of the city. Usually, it is in these sections of the city that some of the worst environmental conditions exist and where the greatest negative impacts of a polluted environment are experienced. Farming increases community interaction and improves community spirit that enhances security and peace. In Dar es Salaam, for example, growing vegetables in Kibasila and Msimbazi valley promotes community spirit and closeness among farmers.

Urban agriculture for waste management and the environment. Apart from nutrition and health, urban agriculture in towns and cities can contribute to waste management and improvement of the environment. The use of high-quality water can be reduced if sewage systems are designed to recycle sewage locally (Wade, 1987). In Dar es Salaam, for example, the mere fact that most people grow crops in most open spaces has reduced the haphazard dumping of solid wastes. In most areas, city council workers and the public have become wary of dumping garbage on people's small plots on which crops are growing. Sometimes, people use solid waste to fertilize their gardens; for example, they use vegetable

remains from the central city market. In other cases, industrial by-products from brewing beer are fed to animals such as pigs, cattle and chickens, thus reducing the burden of garbage collection. Urban agriculture decreases waste management costs and increases economic activities in the city. It appears that with proper planning, it can improve the urban environment and make most towns and cities in developing countries more sustainable ecosystems.

Urban agriculture for conversion of food items. In Dar es Salaam, urban agriculture, especially keeping cattle, poultry, and pigs, converted some disliked food items such as cassava, sorghum, soybeans, cowpeas, and sardines into preferred food items such as eggs, pork, milk, and broiler meat. Although food items such as cassava and sorghum are tropical in origin, and a staple to most African ethnic groups, most people of high, quasi-medium and medium socioeconomic status (SES) do not like to eat them. On the other hand, these food items make perfect ingredients for animal feed. In Dar es Salaam, the increase in urban agriculture has accelerated the demand for these food items from the feed making mini-factories or houses. This has triggered the production of sorghum and cassava, in the up-country regions, thus promoting their rural micro-economy. Livestock also consume large amounts of maize bran, cotton seed cake, and by-products from the beer brewing industry, which would otherwise be wasted. Most people often overlook these indirect advantages of urban agriculture, which play vital roles in creating and sustaining market networks in the city.

Despite these advantages, however, urban agriculture also has several disadvantages. This

is a theme discussed in the next section.

## URBAN AGRICULTURE AND ENVIRONMENTAL DEGRADATION

Although some of the benefits cited for urban agriculture refer to its good effects on urban ecology, there is a gloomy literature which shows that it can in fact be very environmentally damaging in urban contexts. This section examines environmental degradation due to keeping livestock and growing crops in Dar es Salaam. The section is divided into three parts. The first provides an overview of environmental degradation in the light of policy issues (economics, poverty, and its social threat). The second subsection presents data on environmental degradation caused by keeping livestock. The environmental degradation that is due to growing plants is described in the third part of the section.

### The Concept of Environmental Degradation

As urban agriculture has grown in prominence so has environmental degradation. Environmental degradation here refers to the deterioration of the urban eco-system. In Dar es Salaam, urban agriculture has negative effects on the urban environment leading to serious pollution. Sources of pollution in the city include industrial combustion, vehicular traffic, agricultural activities within the fringe of the city, domestic heating, cooling and biomass combustion (Ezaza, 1990; Mayo & Mashauri, 1992; Meghji, 1989). All forms of

pollution are detrimental to the environmental health of most urbanites. The World Health Organization (WHO) (1984) defines environmental health as:

Those aspects of human health and diseases that are determined by factors in the environment. It also refers to the theory and practice of assessing and controlling factors in the environment that can potentially affect health. Environmental health . . . includes the direct pathological effects of chemicals, radiation and some biological agents, and the effects (often direct) on health and wellbeing of the broad physical, psychological, social and aesthetic environment, which includes housing, urban development, land use and transport (p. 5).

A link between environmental degradation and poverty is often seen. In 1992, in Rio de Janeiro, His Excellency President Ali Hassan Mwinyi of Tanzania said that:

The stark of realities of everyday life have shown that environmental degradation in our country is poverty-driven. Increasing poverty and environmental degradation go hand in hand. Poverty is a cause and a consequence of environmental degradation. . . . The primary objective of sustainable development must be to improve the living conditions of all humankind (Mwinyi, 1993, p. 186-187).

In the same vein, Adams (1990) says that:

Poverty and environment are linked in a close and complex way. [Low income people] live in and suffer from degraded environments, and often they create environmental degradation because their poverty forces them to do so. . . . On the other hand, degraded environments themselves create poverty (p. 87).

In the city, most people are trying to fight urban poverty by practising the very urban agriculture that caused environmental degradation thus forming a circle from which there seems little chance of escaping. This leads to 'environmental poverty,' which refers to lack of, or lack of access to, gardens, parks, and play space, as well as the exposure to pollution such as noise and dirt (Blackburn, 1991). This is the desperate ecocide of the poor, small

producers who cause soil erosion in turn exacerbating their conditions (Blaikie, 1985). This thinking further attests to views held by Garret Hardin (1968) in the *Tragedy of the Commons*. Hardin offers a metaphor to clarify some problems of humans in nature. According to him, the finite resources of the world, the limited material basis for life, are the common thing that all organisms, including humans, must share. The tragedy is the seeming inability of humans to administer limited resources in an equitable way. In Dar es Salaam, the problem is made critical by uncontrolled urban agriculture practices, that is, keeping livestock and growing crops that destroy "the commons."

#### Degradation due to Animals

Environmental degradation due to animals is discussed under two sub-headings: risks to health, and aesthetic and social concerns.

Risks to health. Most dairy cattle and chickens kept in the city contribute to human health hazards. Why should we worry about the occurrence of diseases due to animals in the city? It is because of the proximity and number of people found living close together in the city, among other things. The frequency of infection almost universally increases with the size and aggregation of human population (Cohen, 1992, p. 55). Data gathered from the three Dar es Salaam veterinary offices show that in 1985 there were 3,318 head of dairy cattle and the number had grown to 7,105 in 1988 (Mlozi et al., 1989). Field data collected in September, 1993, showed that there were 18,286 head of dairy cattle (see Table 6), and the urban wards of the city kept 9,081 cattle. This represented a 451 percent increase in

cattle from 1985 to 1993 for the region, while it represented a 116 percent increase in the urban wards. This statistic clearly shows that it is possible that there was a danger of having animal transmissible diseases (zoonoses) in the city, in spite of the lack of empirical evidence to prove the connection. As 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 (Mvena et al., 1991, p. 101). Domestic animals are sources of a wide range of infectious agents that pollute the environment. They transmit zoonoses or diseases of animals, which can afflict humans and circulate among other animals. Acha and Szyfres (1987) give an exhaustive list of zoonotic diseases that include brucellosis, tuberculosis, leptospirosis, salmonellosis, psittacosis, q-fever, schistosomiasis, trypanosomiasis, shigellosis, taeniasis and cysticercosis, tetanus, trichinosis, tularemia, pasteurellosis, and yersiniosis. Most of these are transmitted to humans either directly (animals to human and vice versa), or indirectly through the milk, meat, food pollution, water, and soil. For example, the most common brucella species to affect humans is *Brucella melitensis*. In addition, *B. abortus* is also common in Tanzania (Madkour & Gargain, 1989, p. 11). The increase and numbers of animals in the city exacerbated by lack of scientific and modern methods for animal husbandry possibly contributed to the rising incidence of zoonotic diseases.

Studies conducted in other parts of the world (Acha & Szyfres, 1987; Larsen & Munch, 1986; Phillips & Piggins, 1992; Phillips & Sorensen, 1993; Wathes, 1994) suggest that there are harmful pathogens in domestic animal wastes too. According to Acha and Azyfres (1987), harmful bacterial isolated from domestic animal wastes include *Clostridium perfringens*,

*Escherichia coli*, *Neisseria*, *Pasteurella*, *Salmonella dublin*, *Staphylococcus aureus*, *Pseudomonas*, *Streptococci*, *Erysipelothrix rhusiopathie*, *Mycobacterium bovis* and *Mycobacterium paratuberculosis*, *Brucella abortus*, and *Leptospira pomona*. Other diseases included tularaemia, toxoplasmosis, rabies, trichinosis, zoonotic malaria, various forms of encephalitis, and the bubonic plague (Cohen, 1992, p. 54). Most of these pathogenic bacteria are only parasitic in the host and do not multiply outside the host. For example, *Salmonella enteritidis* is found in the internal organs and muscles of hens and egg yolks (Lacey, 1992; Sergevnin et al., 1991), and listeriosis in food animals (cattle, sheep, goats, swine, fowl) (Hird & Genigeorgis, 1990; Lober, 1990). There are diseases such as Bovine Spongiform Encephalopathy (BSE) and Cruetzfeldt-Jakob diseases (CJD) whose symptoms are only manifest in middle-age (Lacey, 1992). Many disease pathogens of farm animals are known to be transmitted through the air (bacteria, fungi, rickettsia, protozoa, viruses) (Wathes, 1992). Even more important, it is believed that domestic animals are the ultimate source of many modern human infections, including most of the major epidemic diseases (Cohen, 1992, p. 61). Cohen, says that the probability of animals transmitting diseases increases when large groups of people are in continuous contact with large groups of animals, exposed to the full range of excretions, tissues, and fluids regularly. In Dar es Salaam, cadavers of urban animals cause significant pollution if dumped to rot on the roads. Moreover, it was apparent that some unscrupulous livestock keepers sold carcasses of such animals to butchers who later sold the meat to the public. This might have led to the spread of diseases to urbanites, such as the red-meat contaminated with things like cysticercus cysts (*Taenia saginata* and *Taenia solium*), *trichuella* cysts, tuberculosis bacteria, *Salmonella*,

*Listeria*, *Bacillus cereus*, and *Brucella* bacteria. For example, *Taenia saginata* (in cattle) and *Taenia solium* (in pigs), and cysts of worms, were common in parts of Africa where meat inspection standards were low (Harrison & Sewell, 1991).

Another potential source for spreading zoonotic diseases in the city is the contracting of itinerant milkers. One milker, for example, usually of the Gogo ethnic group, started milking at 5:00 a.m. and could milk cows from more than ten people by eight in the morning. He could thus spread animal disease pathogens from one head to another while doing the same thing to urbanites who would have consumed the contaminated milk. This can be exacerbated by the fact that most milkers are not checked against communicable diseases such as brucellosis, tuberculosis, and nor are the cows they milk.

Animal dung not removed from sheds and compounds decomposes, producing odour and acting as breeding areas for harmful bacteria and flies. In a survey carried out in Dar es Salaam, approximately 84 percent of the surveyed city dwellers complained about the noxious odour from urban livestock (Moshia, 1991, p. 89). Tetanus, the potentially fatal anaerobic bacteria in "dirt," occur in many animal and human intestines and are only contaminants to soil after infected domestic animals have passed or grazed (Rosen, 1975). Tetanus caused by *Clostridium tetani* causes about 500,000 deaths in the world annually and is more serious in the developing countries (Acha & Szyfres, 1987). This organism is found in the soil and in the faeces of various animals and some humans (Ellner & Neu, 1992, p. 115). The disease occurs when wounds become contaminated with soil containing spores of *C. tetani*. The spores germinate and the vegetative cells produce the tetanus toxin that is absorbed into the system, eventually reaching the central nervous system. In Dar es

Salaam, reported cases of tetanus increased from 106 cases in 1985 to 371 in 1988 (Mosha, 1991, p. 89).

In the same vein, a dairy cow voided an average weight of 20 kilograms (Johnstone-Wallace & Kennedy, 1944) or 45 kilograms (Gowan, 1972) of dung per day. So, at 20 kilograms of excreta per cow per day, the 9,081 head of dairy cattle kept in 1993 in the urban wards of Dar es Salaam would have produced about 181,620 kilograms (181.6 metric tonnes) of waste daily. If 45 kilograms of excreta per cow per day is voided, then 408,645 kilograms (408.6 metric tonnes) of dung is produced per day. In the latter case, the 9,081 head of dairy cattle would have produced 149,139 metric tonnes of dung per year in the city. Dung is dumped in house compounds and along the roadside, and open spaces due to a lack of an elaborate sewage and solid waste collecting system. The keeping of livestock in urban areas has, if anything, worsened the already overloaded sewage system in many urban places (Mvena et al., 1991, p. 78). Animal dung and slurry provide suitable breeding grounds for flies and mosquitoes (e.g., *Aedes spp.*) that are more likely to spread diseases, especially if flies are in contact with human food. About 72 percent of livestock keepers in Dar es Salaam dumped their dung along the roadside, 12 percent used City Council dump trucks, and the remainder used their own transportation to dispose of animal wastes (Shauri, 1989). Similar observations were made by Bongole (1988) about cattle keepers dumping the animal dung along the roadside and fences. In areas where the people use well water, nitrates from animal dung could undergo nitrification and denitrification polluting the drinking water. This poses risks to human health, albeit mild, of methaemoglobinaemia or "blue baby syndrome" and the possibility of increased risk of gastric cancer (Phillips & Sorensen, 1993, p. 64).

In places where dung often accumulates, it qualitatively changes the environment to anaerobic. This causes panic to the city authority that is struggling with the poor refuse collection facilities and malfunctioning drainage (Banyikwa, 1988; Kironde, 1992; Kulaba, 1989; Mosha, 1991). In most developing countries, between 0.3 and 0.6 kilogramme per capita per day of refuse is generated and 30 to 50 percent of solid waste often remains uncollected and either rots, washes away, burns, or is scavenged (Cointreau, 1992). The solid and liquid animal wastes not collected often create nauseating piles of debris with flies hovering over them. From January to April 1993, the city council had enforced the recommendation to zero-graze by impounding animals found grazing outside. The action was presumably taken because of the increased piles of animal dung voided by cattle in the city. Yhdego (1992b), for example, found that the general problems with the solid waste management at the market of Kariakoo in Dar es Salaam was lack of well organized waste storage, and collection and disposal system. These problems are symptomatic of most parts of Dar es Salaam.

Slurry containing dung, urine, and water cleaned from the dairy cattle shed, the chicken shed, and pig pens is not properly disposed of. It pollutes the surroundings that attract disease causing vectors such as *Culex* species of mosquitoes. Mosquitoes are probably the most important insect vectors, even in the urban areas: they bear malaria, yellow fever, dengue, and filariasis, along with a number of lesser known diseases (McGranahan, 1993, p. 118; Satterthwaite, 1993, p. 89). Urbanization increases the concentration of human hosts and domestic animals and has created new breeding sites in sewage and polluted water for mosquitoes such as *Culex quinquefasciatus*, vector of lymphatic filariasis (Service, 1989).

This mosquito has increased throughout the tropics in response to the inability of developing countries to provide adequate waste drainage and sewers in the face of burgeoning urbanization (Sutherst, 1993 p. 136). People also claim that cattle's hooves make holes, especially on wet soil. These holes hold water in which malaria-causing mosquitoes breed thus increasing the incidents of malaria in the city. *Culex* mosquitoes also act "as vectors of Bancroftian filariasis (elephantiasis), which has moved from being a rural to an urban health problem" (Bradley, 1993b, p. 242; Satterthwaite, 1993). The *Culex* mosquito also causes a lower class male-related disease called *Busha* (lymphatic filariasis) in Swahili where the scrotum swells because of the infection of the lymph nodes.

There are two possible water quality problems related to liquid wastes in Dar es Salaam. The first is the direct pollution of surface waters by run-off from livestock keeping households. The second is the contribution that organic manures make to the nutrient enrichment of waters, where nitrate in drinking water is abstracted from surface and ground water sources. This is a serious problem to low income people drinking water from wells in areas such as Buguruni, Mbagara, Mtoni, Ukonga, and Vingunguti. This water would be above the allowable nitrate content in drinking water according to European Community (Archer & Nicholson, 1992) recommendation of 50 milligrams per litre. This could pose problems of people having methaemoglobinaemia and gastric cancer.

Chemical contamination is another serious health problem. Humans use chemicals such as insecticides, acaricide, and herbicides that alone or in combination contribute to the contamination of the environment. The control of East Coast Fever, a disease caused by ticks in cattle, has created a new source of pesticide contamination of humans in the city.

Cows' milk is presumed contaminated when cows are treated with antibiotics to control diseases such as East Coast Fever and mastitis. People do not often seek veterinarians' advices when carrying out such activities. Some urbanites also claim that some farmers feed birth control pills and other contraceptives to broiler birds to attain early sell weights. Some people also claim that some livestock keepers treat animal diseases and endo-parasites with human medications.

People's health is also at risk from gaseous pollutants which include methane, ammonia, and noxious odours. Animals lose gases to the environment during respiration and fermentation. After being excreted, solids and liquids in animal waste become subject to (largely anaerobic) microbial conversions that convert solid or the liquid organic substrate into microbial biomass and microbial soluble or gaseous waste products (Tamminga, 1992, p. 346). Anaerobic microbial conversion contributes to digestion in livestock, in ruminants (cattle, sheep) in their fore stomachs and to a lesser extent in monogastric livestock (pigs, poultry) in their hindguts. Organic matter in animal feed and structural polysaccharides in fibrous material is converted into volatile fatty acids (acetic acids, propionic acid, butyric acid), microbial biomass, fermentation gases ( $\text{CO}_2$ ,  $\text{CH}_4$ ) and heat (Tamminga, p. 346). The blood absorbs the volatile fatty acids, while the rumen removes  $\text{CO}_2$  (carbon dioxide) and  $\text{CH}_4$  (methane) by respiration and eructation. As a result between 5 percent and 10 percent of the energy present in the feed is lost as  $\text{CH}_4$  (Johnson, 1991). Obviously, the  $\text{CH}_4$  contributes significantly to the greenhouse effect (Tamminga, 1992) and farm animals produce 20 percent of the production, of which cattle produce 74 percent (Crutzen, Aselmann & Seiler, 1986). Cattle feed in the city consists of forage containing high fibre contents. This

means that there is more methane gas ( $\text{CH}_4$ ) emitted by the methanogenic flora bacteria as they digest cellulose in the animals' rumen. Cattle and pigs excrete nitrogen in their urine mainly as urea and as uric acid in chickens. Faeces and urine become mixed after excretion and because of microbial enzymes present in faeces, degradation of N-containing compounds occurs. The product of this degradation is ammonia ( $\text{NH}_3$ ) that is repulsive to neighbours and contributes to the impairment of the ozone layer.

In the city, noxious odours from livestock activities are a major problem because of the types of livestock kept, the poor quality of livestock housing, the proximity of houses, and the improper disposal of animal wastes. Other problems included the inadequate or lack of knowledge about animal husbandry and its negative impact on the urban environment. Over ten years ago over 60 volatile compounds had already been identified in animal waste (Spoelstra, 1978; Tarcher, 1992), of which a dozen were considered important contributors to malodour (Tamminga, p. 348). The noxious odour lost from animal manure can be classified as carboxylic acids (acetic acid, butyric acid), phenolics (p-cresol, phenol), aliphatic and nitrogen-containing compounds (ammonia) or sulphur-containing compounds (hydrogen sulphide, dimethyl sulphide, ethyl mercaptan, methyl mercaptan) (Coleman, Feddes, & West, 1991). The odour in animal wastes originates from the degradation of sulphur-containing compounds and anaerobic degradation of protein through deamination, dehydroxylation and decarboxylation of amino acids. The coastal humid and warm temperatures in the city aggravate the production of fumes and odour from chicken's deep litter systems. Other sources are the dairy cattle's sheds, pigs' pens and the outside dumped animal dung whose fumes and odours disturb most urbanites. People's health is also at risk from dust, smoke,

and noise due to urban agriculture activities. Dust emanating from chickens is claimed by medical personnel to irritate eyes, and cause diseases such as asthma and bronchitis. In Dar es Salaam, dust emanating from poultry and cattle shed causes discomfort to most people, especially those allergic to it. The quantity of dust emitted is proportional to livestock and crop activities undertaken in the city.

Emissions due to livestock depend on six things: the physical condition of the shed, the hygiene accorded to the shed, the age of the animals, the type of animals, the number of animals kept in the shed, and the predominant method of husbandry, that is, zero-grazing or left out to graze for cattle, and the use of deep litter system for chickens. In the city, people openly burn mixtures of cow dung and grass (animal debris) cleaned from the shed, and this represents a significant source of air pollution. This is especially common during the dry season and is common among keepers without transportation for taking away the animal debris. Emission from animal debris depends on the moisture content of the refuse and whether it is burned in piles, rows, or spread out along the roadside. Smoke, fumes and odour produced from animal manure are a nuisance to other urbanites. Animals also make noise which disturb urbanites. It goes without saying that noisy animals and odour (stench) from animal waste is a bother to urban residents (Mosha, 1991, p. 90).

Aesthetic and social concerns. In most towns and cities, planting ornamental plants, which include flowers and trees, has been done for a long time to signify urbanity. However, the presence of livestock in most towns and cities can destroy these ornamental plants as the animals search for food. In Dar es Salaam, cattle destroy *graminae* species, while goats eat

most of the herbaceous plants, including those that are used as hedges around people's compounds. Cattle eat grass around people's homes, along the roads, and in open spaces, making them bare and predisposed to soil erosion. Destruction of flora, especially grass and brush, is also done by people who gather feed for the animals. Animals also hamper urban reforestation efforts by devouring and trampling on the tree and flower seedlings. Animals also destroy the infrastructure. In the city, most senior officials live in government or public houses that have servants quarters. Cattle, chickens, and goats housed in the servants' quarters cause extensive damage, often rendering repairs impossible. Large animals such as cattle cause extensive damage to roads, water lines, and telephone installations. Animals also cause extensive damage to recreational areas, fences, and traffic signs. In the city, soil erosion caused by people and animals is on the increase. People till the soil to grow crops, and gather grass for their animals, and livestock feed on its cover and trample on the soil cover. The soil is left malleable and susceptible to erosion by wind and water, a prerequisite for direct and indirect urban desertification.

Livestock also destroy the city's beauty. In a town or city, the presence and orderliness of flowers, ornamental trees, parks, lawns, and roads contribute to the beauty of the city. They form an urban ecosystem in which damage to one or two elements can lead to the destruction of the city's aesthetic. In Dar es Salaam, animals destroy the beauty of the city in several ways. First, there is the physical presence of livestock, and the haphazard erection of sheds to house them. Second, the dumping of animal excreta everywhere renders the city unpleasant to most urbanites. Animals obstruct the movement of traffic in the city. Urban areas usually have high numbers of vehicles and pedestrians on the roads. When domestic

and commercial animals such as cattle and goats use the same roads serious problems arise for conventional road users. In the city, they obstruct pedestrians and motorists, and sometimes cause accidents. The Dar es Salaam City Council (1990) report showed a substantial increase in animal-caused accidents, from 12 in 1985 to 176 in 1989. This is an increase of 1,366 percent in a period in which the number of accidents overall rose by only 25 percent.

### Degradation Due to Plants

Environmental degradation problems caused by plants are fewer than those caused by animals. These are discussed under two sub-headings, risks to health and aesthetic and social concerns.

Risks to health. Malaria is the most important vector-borne disease in Dar es Salaam and is transmitted by four human malaria parasites: *Plasmodium falciparum*, *P. vivax*, *P. congolense*, and *P. ovale*. *Plasmodium falciparum* is the most important parasite because it causes malignant malaria. All these parasites are transmitted by mosquitoes such as *Anopheles gambiae* that breed under plant canopies. Health and medical personnel claim that watering plants creates moist conditions underneath the plants that act as suitable breeding grounds for the mosquitoes. In the city, this applies to most vegetables grown in the city such as amaranths, Chinese cabbage, tomatoes, and eggplants. The increase of malaria in towns and cities is also linked to agronomic practices. For example, most people make ridges in which they grow crops such as maize, pigeon peas, sweet potatoes, and

cassava. During the rainy season, the furrows made between the ridges become pools for the rain water in which malaria-causing mosquitoes bred. Crops have generally been claimed to be unhealthy in the city. One feature of all crop husbandry is the use of fertilizer. The use of organic manure such as that from chicken and cattle is said to spread harmful disease pathogens and worm cysts causing health problems to people (e.g., Ellner & Neu, 1992; Harrison & Sewell, 1991). In the city, this can happen when vegetable growers transported animal manure from livestock keepers' shed to their gardens. It is also a risky practice to spread waste containing infectious agents on fields with growing crops, especially those intended for raw consumption (Opuda-Asibo, 1989, p. 277). Improper handling of animal manure might also transmit parasites such as hook worm cysts (*Taenia solium*), which are common in pig manure.

The fact that crop growers use pesticide also poses problems. Most developing countries, because of their economic condition, do not have the infrastructure to adequately regulate the use and availability of pesticides, nor to monitor pesticide residues in food or in the environment (Perfecto, 1992). Tanzania is no exception. Health related problems included those arising from the use of pesticides and from the use of polluted water for irrigating vegetables. Literature is replete with implications of pesticides on humans (Ferreira & Seiber, 1981; Markowitz, 1992; McConnell et al., 1992; McGranahan, 1993; Mosses, 1989; Mwanthi & Kimani, 1993; Seiber & Woodrow, 1981). Furthermore, airborne residues present a potential exposure route for farm workers and other individuals dwelling near agricultural sites, and atmospheric transport may be a major path for widespread distribution of pesticide--the more persistent ones--in the environment (Canter, 1986, p. 196). In Dar

es Salaam, the author observed youth and women at Kibasila, along new Bagamoyo, and Morocco roads, and in Mabibo areas spraying organophosphorus and carbamate insecticides. Farmers clandestinely obtained these chemicals from the City Council workers who were spraying them on malaria-causing mosquitoes' breeding, feeding and resting grounds. Another apparent contamination of vegetables was seen when youth and women at Kibasila in an area of about ten hectares, used polluted water emanating from the sewage effluent from the Temeke area as the sole means of watering amaranths, Chinese cabbage, and okra. In addition, the people growing vegetables used no protective gear when handling and spraying pesticides on vegetables.

Aesthetic and social concerns. Plants also destroy the beauty of urban areas in various ways. The manner in which people grow different species of crops in the city is said to destroy the city's beauty--aesthetic is ruined, for example, when different species of crops are grown haphazardly. Also, crops look attractive only up to harvesting time. Soon after harvest, the remains of the crops on the plot become eyesores. Crops that are one metre high that include plantains, maize, cassava, and pigeon peas are blamed by people for hiding criminals and other undesirable elements in the community. In the same vein, Diallo (1993) says that since 1989, despite successful results of urban agriculture, authorities in Bamako, Mali, have banned the cultivation of cereals. The reason is that the tall stalks provide hiding places for bandits. In Dar es Salaam, such crops as plantains, maize, cassava, and pigeon peas could hide bandits. Moreover, if these crops were planted at decisive points or sharp corners, they were said to cause traffic accidents because they obscured the vision

of motorists and pedestrians.

Urban agriculture activities belong to an informal sector that under uses most factors of production. In Dar es Salaam, it is common to find that a whole family of, say, four people work on a small plot, something that should have been done by one person. In some areas, people grow vegetables that include amaranths, tomatoes, and Chinese cabbage on plots that are suitable for building a hotel, shopping mall, and shops. In this way, highly valued building land is used for urban agriculture activities. This raises major questions of public policy. In the following section we examine the role of government and the policy context for urban agriculture.

### THE ROLE OF GOVERNMENT IN URBAN AGRICULTURE

The most common social and political use of the term policy refers to a course of action or intended course of action conceived or deliberately adopted, after a review of possible alternatives, and pursued, or intended to be pursued (Gould & Kolb, 1964, p. 509). In Tanzania, government ministries, departments, institutions, and several other agencies carry out public administration. The legislative and judicial sections including other internal and external controls of the government regulate these departments and agencies. Also, various government ministries such as Agriculture, Livestock Development and Cooperative (MALDC), Education and Culture, and Health, Lands, Housing and Urban Development execute most of the government policies (see Table 8).

Table 8

Some Government and City Council Policies

Policy	Aim(s)	Executing agency(ies)	Target group(s)
<b>National Level:</b>			
Economic policy	To improve national economic growth	Govt. ministries, institutions, banks, private sector, NGOs	Society (rural & urban)
Agricultural policy	To increase agricultural production through liberalizing input distr., credit, pricing, and marketing. To encourage individuals to lease land for agriculture production	MALDC, other ministries, institutions, crop coops & societies, private businesses, and crop boards	Society (rural & urban people), private sector, govt. institutions, crop coops, boards, & prim. societies
Educational policy	To expand school enrolment and improve its quality, increase govt. expenditure on primary, adult, and higher educ.	Ministry of Education & Culture, govt. institutions, private sector, society, NGOs	Society (rural & urban)
Social Policy	To improve social services, esp. for the poor—education, health	Ministry of Health, govt. institutions, private sector, NGOs	Society (rural & urban)
Sectoral reform policy	To encourage the entry of foreign industrial firms, promote local industrialists, and privatization	Ministry of Industries, MALDC, govt. institutions, private sector,	Private sector, govt. institutions farmers, foreign firms, NGOs, urbanites
<b>City Council Level:</b>			
The Dar es Salaam city council (DCC) (Animals in the city) by-laws	To regulate the keeping of livestock and their movement	City Council, govt. dept. of agric., councillors, health, planning, govt. police force	Urbanites (people of higher & lower in status)
The DCC (Disposal of refuse) by-laws	To regulate the disposal of city refuse (dust, garbage, decaying animal, vegetable, or noxious matter)	City Council, councillors, health, police force	Urbanites, business people (restaurants, hotels), govt. institutions
The town and country planning (Dar es Salaam master plan area) order	To regulate the development of city land	City Council, councillors, govt. dept of town planning, police force	Urbanites, business people, the informal sector, institutions

But ministries, departments, institutions, and parastatals also make their own policies.

Table 8 shows an example of two levels at which policies affecting urban agriculture are

made: the national government and the Dar es Salaam City Council (DCC). While the national agricultural policy appears to encourage urban agriculture, the DCC regulates it. One reason for this is that the national agricultural policy is broad enough to benefit mostly the rural populace, but it overlooks problems that urban agriculture can engender in urban centres.

In the first subsection which follows, the various central government policies affecting urban agriculture are examined. City policies are looked at in subsection two, while means of ensuring adherence to policy are examined in subsection three. This section concludes by briefly mentioning other community based agencies supporting urban agriculture.

#### National Policies Governing Urban Agriculture

This section discusses the emergence and intensification of urban agriculture in five policy promulgation periods. These are the periods of 1961 to 1965, 1967 to 1970, 1971 to 1976, 1977 to 1980, and 1986 to the early 1990s. In Chapter 2 I discussed the severity of the economic crises the country has endured from the mid-1970s, situations that were largely precursors for policy formulations. Although, there were no specific policies made for urban agriculture, national agricultural policies have implicitly affected agriculture in towns and cities.

The period from 1961 to 1966. During this time, economic policy was mainly concerned with the maximization of growth through private enterprise. Macro economic policies restricted overspending to realize funds for much needed public investment in human and

other physical infrastructure. In rural areas, peasant farmers produced cheap food for people living in urban centres. During this period, most urbanites of low incomes kept local poultry and grew a variety of vegetables and field crops mostly for subsistence needs. In Dar es Salaam, some people in Keko area grew amaranths for commercial purposes.

The period from 1967 to 1970. The 1967 Arusha Declaration initiation occurred during this period. This was the turning point for the Tanzanian political environment, and for the economy. In 1967, TANU (the then ruling party) released two policy documents: the Arusha Declaration and another on Socialism and Rural Development (Nyerere, 1968). The Arusha Declaration represented the Tanzanian commitment to socialism and was soon followed by the nationalization of major "private enterprises" with the emphasis on *ujamaa* production - "working together" for the "common good." Now the emphasis was to stimulate villagers to take action on their own behalf. No longer would the government use a "top-down" procedure based on an unattainable master plan. Now the discourse on agricultural development involved words like *ujamaa* and working together (participation). During this period, the emphasis was on self-reliance, public sector dominance through public institutions (parastatals), rural development through "*ujamaa vijijini*" (pulling together), a leadership code, and education for self-reliance. Urban agriculture remained the same as it was in the first period.

The period from 1971 to 1976. The 1970s were years of economic turbulence and hardship: the government decentralized local governments in 1972, and passed the Village

Act of 1975 that settled 85 percent of the peasants into planned *ujamaa* villages. It was a decade of drought, with widespread food shortages exacerbated by meagre foreign exchange reserves that could be used to import food. Agricultural experts, politicians, climatologists, and amateurs agreed that the weather alone was responsible for the food shortages in Tanzania. Drought was responsible for the acute food shortages in 1968, 1973, and 1978 that occurred every five years. It was during this period that national agricultural policies implicitly initiated "commercial" urban agriculture. People of all income levels started to grow amaranths and keep laying and broiler chickens in their backyards and compounds.

Agriculture was apportioned meagre human and fiscal resources even though most politicians, policy makers, and other experts agreed that agriculture was the backbone of the economy. Other blueprint policies had a negative influence on agriculture production. In 1974, for example, the villagization process for the carrying out of the *ujamaa* philosophy saw the decline of both food and cash crops. Other factors contributing to the poor performance of the agricultural sector included natural calamities and skyrocketing prices for agricultural supplies like fertilizers, pesticides, and tools. There was also a lack of incentives for agricultural producers, such as better prices for crops. Having seen the decline in food and cash crop production, TANU and the government announced policies to alleviate the situation. In May 1972, the party issued a major policy document called *Siasa ni Kilimo* (Politics is Agriculture) which aimed to correct the deteriorating performance of the agricultural sector in the country. Later, in 1974, *Kilimo cha Umwagiliaji* (Irrigated Agriculture) was added as a follow-up to the *Siasa ni Kilimo* policy and emphasized the need to adopt irrigation in agriculture. The campaigns of 1974/75 also

boosted urban agriculture. These included *Kilimo cha Kufa na Kupona* (Agriculture for Life and Death) and *Mvua za Kwanza ni za Kupandia* (First Rains are for Planting). These were food self-sufficiency policies also carried out by urban employees, some of whom were issued land outside the city to cultivate.

In the 1970s, the government, in a bid to carry out the above policies, established "urban agricultural extension" services supervised by the Ministry of Agriculture, Livestock Development and Cooperatives (MALDC). Offering agricultural extension or nonformal education by MALDC employees to urbanites was an explicit government policy to encourage urban agriculture. Agricultural extension (livestock and crops) "is an education with a dual goal: it brings information and technology to farmers and teaches them how to use it to improve their productivity; and it enables farmers to specify their own needs and provide feedback on the effectiveness of extension in meeting them" (Saito & Weidemann, 1990, p. 1). In Dar es Salaam, extension agents provide "farmers with the skills and information they need to be better managers of their own enterprises" (Shwartz & Kampen, 1992, p. ix). MALDC, using its Agriculture and Livestock Extension Service Agents (ALESA), promotes keeping livestock and growing crops in the city. ALESA visit urbanites and impart modern skills and knowledge about agriculture so that production will increase. MALDC hatchery farms also sell day old chicks to urbanites. The ministry, using ALESA, also sells animal medications and occasionally treats urbanites' animals at its three district animal clinics.

The period from 1977 to 1985. The emergence and intensification of urban agriculture

can also be attributed to the policies issued from 1977 to 1985. These include policies of import liberalization, foreign exchange retention, and policy reform measures adopted in the economic recovery program. All these policies helped to reduce shortages of food and consumer goods, spare parts, and other imports. The food shortages in the early 1980s made the government announce six policy reforms. These were: (1) the National Economic Survival Programme (NESP) of 1981-1982, (2) the National Food Strategy of 1982, (3) the National Agricultural Policy (NAP) of 1982, (4) the National Livestock Policy (NLP) of 1983, (5) the Structural Adjustment Programme (SAP) of 1982-1985, (6) Economic Recovery Programme (ERP) of 1986-89, and the Economic and Social Action Programme (ESAP) of 1989-92. All these policies, especially the NLP and NAP, motivated urbanites to do urban agriculture because they allocated more fiscal resources to crop and animal production sectors. In this way, NAP "went one step further than the structural adjustment programmes in recommending liberalization in the countryside. Agricultural pricing was seen as vital for incentive purposes" (Stein, 1992, p. 68). NAP covered all of the important aspects of the sector, from modes of farming, land tenure, agricultural marketing, pricing, and credit to financing. Evidence suggests that people of high and quasi-medium socioeconomic status (SES) borrowed from the national banks on the pretext that they were using the money to develop peri-urban farms. However, evidence suggests that most people used the borrowed money to buy dairy cattle, laying hens, and broiler chickens that were kept in the city.

The period from 1986 to the early 1990s. This period saw a dramatic intensification and

development of urban agriculture which was partly because of Economic Recovery Programme (ERP) of 1986-1989 and the Economic and Social Action Programme of 1989 to 1992 that were part of the ongoing structural adjustment programmes carried out throughout the period. In summary, whereas from 1967 to 1985, Tanzania tended to carry out policies that were good for equity but bad for growth, the policy reform in this period started to consider the need for incentives, efficiency, and economic growth. Urban agriculture during this period has been intensified and developed in many ways. For example, private companies and individuals have imported small hatching incubators, dairy cattle heifers, day old chicks, milking machines, milling machines, feed mixing machines, and animal medications. In Dar es Salaam, private poultry feed companies such as the Interchick and Rajan companies started mixing animal feed for the burgeoning urban dairy cattle and poultry raising enterprises.

In May 1992, Tanzania adopted policy reforms designed to foster political pluralism and democratization after being a one-party country under *Chama cha Mapinduzi*-(CCM) ("Tanzania becomes," 1992). This also intensified and developed urban agriculture because most members of the elite and business bourgeoisie were buying farms in the peri-urban areas. Livestock enterprises in the city continued unhampered. In the Dar es Salaam metropolis, for example, the suburbs of Kigamboni, Mbangara, Mbezi, and Ngongo la Mboti were becoming the "chicken belts." It is because of these developments that the next section examines policy affecting urban agriculture in the city.

### City Policy Affecting Urban Agriculture

Administratively, the Dar es Salaam City Council (DCC) falls under the prime minister's office, and its chief officer is the city director. Under the director, there are several departments such as health, agriculture, commerce, and transportation. The DCC operates through several committees such as the planning and health committee, and uses sectoral experts to facilitate the functions of its committees. The DCC policies follow the master plan approaches (1948, 1968, 1979) in enforcing the Town and Country Planning legislation. Activities of the city include coordinating development activities of the utility agencies, central government ministries and parastatals, the private sector and communities. To properly coordinate these activities and yet maintain the city's ecology, DCC uses legislation as directed by the central government (see United Republic of Tanzania Government Notices Nos. 15 of 1990, 16 of 1990, and 405 of 1985). One of those activities regulated by the DCC is urban agriculture. As Table 8 shows, there are three city policies regulating urban agriculture activities. The "DCC Animals in the City Bylaws" regulate the keeping and moving of animals in all the areas lying within the boundaries of Dar es Salaam city. Animals here include camels, cattle, donkeys, goats, mules, pigs, sheep and rabbits, but do not include cats and dogs. The "DCC (Disposal of refuse) Bylaws" regulate the disposal of refuse by premise occupiers on streets. A street includes a road, highway, path, sanitary lane, sandy lane, thoroughfare or any public space. The "Town and Country Planning Order" forbids any person or institution to develop any land within the Dar es Salaam Master Plan area without planning consent duly approved from the ministry of town planning. At this juncture, one could ask: What means are used to ensure that bylaws are

complied with by most urbanites? The next subsection provides answers to this question.

### Means of Ensuring Policy Adherence

There are four methods of maintaining policy: MALCD agents inspecting agriculturalists' premises, using the government police force and DCC militia, the use of mass media, and the use of other agencies. Each of these methods is explained below.

MALCD extension services. MALCD agriculture and livestock extension agents also ensure policy adherence when they inspect agriculturalists' premises before issuing permits for keeping livestock. Evidence suggests that in practice most agents have not carried out this activity effectively. This is because of the acquiescence of agents to people above them socially, high socioeconomic status of some agriculturalists, and declination of agents to regulate urban agriculture. Another reason has been the agents' lack of knowledge on environmental damage and its impact on public health that urban agriculture can cause.

The police force and militia. The DCC does not have a police force to ensure that policies are observed. However, the rampant violations of policy directives prompted the DCC to deploy its militia with the government police force. From January to June 1993, for example, the police force and the DCC militia impounded livestock (cattle, goats) found roaming around in the city. At the end of September 1993, the operation was a success as few animals were seen roaming about. Similarly, in the growing of crops, the police force and the militia have occasionally slashed crops growing one metre high (maize, cassava,

plantains) because health and medical personnel have claimed that they harbour malaria-causing mosquitoes. Such means of ensuring policy adherence have been criticized by most people as too ad hoc, and because they lack continuity, agriculturalists often relapse into their previous behaviour.

The mass media. The mass media play vital educational roles in ensuring that the policy is followed. In 1988, for example, an editorial comment in an English newspaper, the *Daily News - Tanzania*, said that:

. . . . For example, in July last year the City Fathers directed all livestock keepers to practise what is known as zero grazing, failing which stern action would be taken against defaulters. Surprisingly, the directive has effectively been violated and the city Fathers appear to have abandoned the whole idea. . . . ("Editorial," 1988).

The newspaper further commented that the whole issue of keeping livestock in the city needs a lasting solution. It also urged livestock keepers to keep fewer animals that yield maximum production. Many pieces of such educational advice has been broadcast in the mass media. Another example is a warning carried in a Swahili *Majira - Tanzania* newspaper reiterating that "keeping livestock in the government quarters was a violation of the DCC bylaws of 1990" (trans.) ("*Atakayefuga Kuadhibiwa*," 1994). The radio station occasionally reminds urban agriculturalists to follow the DCC policy regarding practices for sustainable city development.

Other agencies for policy adherence. The DCC policies also are maintained through the efforts of several agencies such as the public health inspectors, health education officers,

environmental health officers, and other officers of selected public institutions. Key institutions include the National Environmental Management Council, the National Commission for Land and Planning, and the urban planning department of the Ministry for Lands, Housing and Urban Development. The judicial department of the DCC plays a major role in policy adherence because it is the agency that prosecutes city bylaws defaulters.

### SUMMARY

This chapter has discussed the phenomenon of urban agriculture, both world-wide and in Dar es Salaam. Six characteristics of urban agriculture in general were noted: 1) in some countries urban agriculture is mainly carried out to provide food for the low income people, 2) in other parts of Africa, urban agriculture is not merely confined to the urban poor but also to urbanites who are well off, 3) in most parts of African towns and cities, including some countries in South America, urban agriculture is a survival strategy mostly carried out by low income earners and the poor, the majority being women, 4) all over the world, urban agriculture is constrained by the lack of things like enough land to cultivate, start-up capital, water for irrigation, and farming equipment, 5) urban agriculture throughout Africa and other parts of the world has not been accepted by urban planners and administrators, 6) people derive food and money from urban agriculture. In Dar es Salaam, most people do urban agriculture because of six benefits: nutrition, income generation, poverty reduction,

community well-being, waste management, and conversion of food items.

Section two of the chapter discussed the environmental degradation caused by keeping livestock and growing crops. Both these major urban agriculture activities engender risks to health, and cause aesthetic and social concerns. Keeping livestock can cause diseases and health problems and destroy the flora, infrastructure and the beauty of the city. Growing crops can also cause diseases and health problems and destroy the beauty of the city. Plants can cause social problems and obstruct traffic. It appears that as the economy continues to decline and demand rises for agriculture products (milk, eggs, broiler meat, vegetables), agricultural wastes are increased in the urban environment. This has evidently increased environmental degradation. Section three, described the two levels at which policies governing urban agriculture are made: the government and the City Council. The relationship between policy and the practise of urban agriculture is seen to be both direct and indirect. Government national agricultural policies promulgated from the 1960s to the early 1990s have encouraged urban agriculture in Dar es Salaam. City policy is intended to regulate urban agriculture using several methods of ensuring policy adherence.

**CHAPTER 4****FIELD RESEARCH PROCEDURES AND THE  
CHARACTERISTICS OF RESPONDENTS**

The broad question addressed by this study is how can we explain the persistence of urban agriculture in Dar es Salaam in light of its evident damaging effects on the urban environment? This broad question was examined using five specific questions, namely:

- 1) What is the nature of urban agriculture in Dar es Salaam?
- 2) What damaging effects result from urban agriculture?
- 3) To what extent do people have information about urban agriculture and its effects?
- 4) What is the nature and structure of government policies, agricultural extension and City bylaws concerning urban agriculture?
- 5) What is the nature and structure of economic, social, and cultural factors concerning urban agriculture?

Some answers to questions (4) and (5) and a partial answer to question (2) have been attempted in Chapters 2 and 3. Those chapters drew on a number of secondary sources and on government and agency documents and study reports. The answers to question (1) and, in part (2) depend on field data from interviews and observations conducted specifically for this study. The present chapter describes the design of the data collection and analysis for the interviews and observations. It also describes the characteristics of the respondents. The first section considers the procedures for the selection of respondents and the data collection. Section two discusses data preparation and analysis. Section three describes the characteristics of the respondents.

## SELECTION OF RESPONDENTS AND DATA COLLECTION

The section on selection of respondents is explained under three subsections. The first subsection discusses the selection of respondents starting with the clearance procedures followed by the selection of urban agriculturalists, and finally that of public officials. Subsection three examines data collection. First, is a discussion on how access was gained, and then are sections on data collection from urban agriculturalists and public officials. The last subsection examines data collection through field visits and observations, and experience.

### Selection of Respondents

The present study sought to include the views of those doing or connected with urban agriculture. The concern was with trying to unravel the perceptions, experiences, and actions of urban agriculturalists themselves about five animal-related issues: psycho-social, socio-political-legal, and those related to disease-health, accident, and city landscape. The study also included the views of public officials to understand the "macro-level" concerns of the phenomenon outside the milieu of the people doing urban agriculture. This section discusses the selection procedures used for respondents of two kinds: the 29 urban agriculturalists and 27 public officials. The section begins with describing the clearance procedures.

Clearance procedures. The researcher arrived in Tanzania on July 3, 1993 and proceeded

to Sokoine University of Agriculture in Morogoro to obtain a required research clearance. The researcher forwarded the clearance letter to the Regional Commissioner's office of Dar es Salaam (see Appendix 3). The Regional Commissioner's office wrote letters to districts of the region of Dar es Salaam (Ilala, Kinondoni), authorizing the research. The district offices in turn wrote clearance letters to their ward secretaries permitting the research to proceed (see Appendix 3). The district commissioners' offices wrote letters of clearance only to those wards selected by the researcher for the study. The letters from the university and those written by the Regional Commissioner's office were enough proof to convince urban agriculturalists, public officials, and informal interviewees that the research was authentic.

Selection of urban agriculturalists. This study was concerned with people over eighteen years of age in two Dar es Salaam urban districts (Kinondoni, Ilala) who practised mixed urban agriculture in five areas. These areas have different plot sizes and population densities. Two areas were in the district of Ilala. These were Kalenga and Shabani Robert (quasi-medium density areas typical selected house-plot sizes of between 1,750 and 2,400 square metres). Three areas were in the district of Kinondoni. These were Oysterbay (a low density area with house-plot sizes of 3,640 square metres), Kinondoni Block 41 (a medium density area with house-plots sizes of 896 square metres) and Kinondoni Block A (a high density area with house-plot sizes of 300 square metres). The size of the house plots affects the type of urban agriculture activity. The researcher selected areas so as to have representations of people from different densities, and adopted a multistage random

selection that involved wards, areas within the wards, and the house-plot size/numbers. At the road intersections, the researcher tossed a coin to decide the direction to follow to get a house with urban agriculture activities if the one randomly selected did not keep livestock. After finding the house with urban agriculture, the researcher knocked at the person's gate or door. And after being admitted, the researcher explained the aims of the study and asked whether the woman or man could participate in it. If they agreed, then the researcher arranged with one of them a day and time for the interview. Thirty households were initially selected. One was later dropped from the analysis because she proved not to have any livestock.

Selection of public officials. The researcher chose and interviewed 27 public officials from six areas of specialty: agriculture and livestock, urban land use and planning, urban public health, resource assessment (environmental issues), media, and politics (see Appendix 17). Because urban agriculture activities affected the functions of government departments or public institutions in which all the selected officials worked, it was assumed that they knew something about urban agriculture and its damaging effects. This assumption proved to be correct. Of the 27 public officials, ten were with the Ministry of Agriculture, Livestock and Cooperative Development (MALCD) staff. The interviewees came from three levels: headquarters, regional, and district offices. Another group of seven public officials had training in public health, which was important for understanding the damaging effects of urban agriculture from a public health viewpoint.

### Data Collection

Data collection for urban agriculturalists and public officials was by means of structured and semi-structured interview schedules. The researcher also made observations of the extent and nature of urban agriculture practised in the interviewee' homes. The following paragraphs explain how access was gained, and then describe the procedures used in interviewing urban agriculturalists and public officials respectively. A third subsection describes the field observation procedures.

Gaining access. The last step before securing data involved gaining access to the urban agriculturalists and public officials. This was important to (1) establish the researcher's credibility; (2) raise the interviewee's awareness and interest for the forthcoming data-collection; and (3) arrange for a convenient day and time to conduct the interview. The researcher achieved all these objectives during the first informal visit. During the introduction session, the researcher stated who he was, where he worked, and explained what information he wanted from them and why. Some would-be interviewees, especially the urban agriculturalists, wanted to know the use of the information collected from them. The researcher assured them that he was in no way connected to the City Council or the government. This was important because the urban agriculturalists mistrusted some government officials since their animals were impounded for grazing outside by the City Council from January to April in 1993. The first encounter aimed at getting interviewees to select the day and time it was convenient for the interviews. However, it proved difficult for most interviewees to keep to the proposed times and days. On average, the researcher

made two visits before carrying out an interview. This often happened with public officials, especially those of higher status. All interviews with the urban agriculturalists were done in their homes, while those of public officials were done in their offices.

Urban agriculturalists. Each interview sought three kinds of information: personal and demographic details, information about the respondent's agricultural practices, and information about his or her knowledge of environmental damage. The researcher reintroduced himself and pointed out the objectives of the study. The researcher made it clear that he was not part of the City Council nor of any government institution whose function was to regulate urban agriculture. Introductions had to be clear to remove any suspicions respondents might have had about the officials. Earlier on, from January to April 1993, the Dar es Salaam City Council had impounded most animals found grazing about the city, especially cattle and goats. Urbanites whose animals were impounded paid fines to retrieve their animals. This incident had infuriated most urbanites who kept animals. As a result, most livestock keepers were hostile to anyone who went around asking questions about their enterprises. However, the researcher experienced no hostilities from the interviewees during the study, perhaps because of the elaborate introduction and the institution the researcher worked for in Tanzania. Next the researcher read to each respondent the first section (see Appendix 9) of the contract, specifying that respondents' names would not be written on the questionnaires and that the information they gave would be kept confidential.

The researcher asked the interviewee the 13 questions from the first set on the interview

schedule (see Appendix 10). These questions concerned the respondents' data on their urban agriculture enterprises. The researcher then put the 12 questions from the second set about the respondent's socio-demographic status (see Appendix 11). Responses to both these sets of questions were entered in the appropriate spaces on the schedules. The researcher then asked for permission to continue to the third part of the interview. These questions elicited information about respondents' knowledge of environmental damage resulting from urban agriculture. There were two main sets of questions, concerning keeping animals and growing crops respectively. Respondents were asked to state which of the two urban agriculture enterprises was the predominant one. As it turned out, most people had only one predominant urban agriculture enterprise, that is, keeping livestock. Questions were formulated so as not to appear to attach blame to the respondents for any damage referred to. For example, a typical question read "Some people say that animals disturb urbanites. Others disagree. What do you think?" After a reasonable discussion of each question, the researcher asked about the respondent's reasons for continuing the agricultural practice being discussed. In addition to the set questions, probing questions were used to elicit more information about the persistence of urban agriculture despite of its damaging effects on the urban environment. The common probes included: In your thinking, do most people. . .? ; What brought this problem about? ; What about people who say that. . .? ; In your view, are those claims. . .? ; Tell me other reasons apart from. . . ; and Do you have anything to add?

All interviews were conducted in Swahili. The researcher found that comprehension and expression of ideas was easier in Swahili, a language spoken and understood by all urban

agriculturalists. Interviewees provided frank information about their experiences, perceptions, opinions, observations, and feelings about the persistence of urban agriculture and its damaging effects on the urban environment. The interview used a conversational style where respondents appeared to reflect on the practical "realities" of urban agriculture.

Each interview lasted about three hours. All responses were tape-recorded and the tapes were coded for later identification and transcription. The researcher checked for coverage of questions on the interview schedule and asked respondents if they had anything to add before concluding the interview. After the interview, the researcher asked if he could be shown around the respondents' enterprise(s). All respondents agreed to this. At the end of the interview and the visits the researcher thanked the interviewee and left.

Public officials. The researcher again used semi structured interview schedules (see Appendix 16) to elicit information from public officials in their work places and audio tape-recorded the interviews. Questions differed based on the public officials speciality, so that officials who worked for the Ministry of Agriculture, Livestock and Cooperative Development responded to different questions from those answered by officials who worked for the Dar es Salaam City Council. Similarly, public officials who worked for the public health, environmental management, and the University of Dar es Salaam also responded to questions that were different from the rest. On average, an interview took about an hour. All interviews were tape-recorded.

The procedures for interviewing public officials involved the following steps. (1) The researcher visited the head offices of the above named areas and made an informal

introduction. He showed the head of the department or the person in charge of the establishment the clearance letter for conducting research from Sokoine University of Agriculture, and described the aims of the study. (2) One of two things occurred: (a) The department head directed the researcher to a person in the department that he or she believed was the expert in the area and so thought that they would give more information. Or (b), the head of the department had time for the interview, and the researcher arranged for a date and time. (3) Where the researcher had followed through with the step (2) (a) above, the designated person was contacted and then the step (1) above was repeated (i.e., introduction, the interview date and time were arranged). (4) In the interview, the researcher asked the public official questions from a colour-coded semi-structured schedule for her/his profession. The questions sought explanations about the persistence of urban agriculture and its damaging effects in the city (see Appendix 12). (5) After a reasonable discussion of each main question, the researcher asked probing questions to elicit more information and clarify some ambiguous issues. (6) All interviews ended by thanking the interviewees for providing some of their useful time. Again, all interviews were conducted in Swahili.

Field visits and observations, and experience. The researcher recorded all observations made during an approximately fifteen-minute tour around the urban agriculturalists' enterprise(s) and their surroundings on the observation forms (see Appendix 13). Information gathered during observations focused on the cleanliness of the compound, the types of animals kept, the cleanliness of the shed, and the presence of animal dung in the

compound. The central aims of the observations were to cross-check and verify the validity of information given by the respondents during the interviews and to find out about their urban agriculture situation. Most observations from the respondents' compounds were immediately recorded after leaving the respondents' sites, or upon arriving at the researcher's accommodation. Other types of observations were the general ones made outside the respondents' compounds (city wide), all entered in field notebooks, and later reconstructed as field notes. Connected with these observations, the researcher took 60 still pictures of urban agriculture activities to further aid in understanding the phenomenon. The researcher's experience through his involvement in an urban agriculture research project for four years (1986-1990) was an added source of data for this study.

## DATA PREPARATION AND ANALYSIS

Data preparation and analysis are discussed under three subheadings. These include data transcription, data verification, and data reduction, coding and interpretation.

### Data Transcription

The process of transcription involved playing the interview tapes and carefully listening to the recorded Swahili information and transcribing it in English. This procedure produced 345 and 142 single-spaced pages of transcription text from the 29 urban agriculturalists' and 27 public officials' tape-recorded information, respectively. Transcription was slow, involving

several play-backs of tapes to capture the full meaning of the information given.

### Data Verification

A crucial step in this study was the need to check for the credibility (internal validity) of the transcription data. The important question here was: Does the transcribed data accurately represent the tape-recorded information as originally given by respondents in the field? Four Tanzanian students (conversant in Swahili and English) pursuing doctoral degree programs at the University of British Columbia did the verification. The researcher randomly selected 50 percent of each transcribed interview. Each Tanzanian student was carefully asked to listen from a tape recorder to play-backs of field-recorded Swahili information. Then the researcher stopped the tape and asked the student to read the English transcription data of what he had just heard from the tape and verify that it represented the actual words of the respondent. The students were allowed to put marks on the transcription data sheets. If the student was in doubt, the researcher repeated the procedure for clarification. The verification of the randomly chosen 50 percent transcripts showed no problems of translation. The researcher considered this a satisfactory basis on which to proceed with the coding and analysis of all transcripts. Each interviewee was assigned a unique reference number indicating whether the respondent was an urban agriculturalist (UAs) or public official (PO). These reference numbers (e.g., UAs 01, PO 06) are used to identify each quotation given in Chapter 5 of this study.

### Reduction, Coding, and Interpretation

The procedure for data analysis started when the researcher read a set of questions and the transcription data several times. During this period the researcher jotted down some ideas as they came to mind, listed emerging topics, clustered and viewed their relationships. For the first part of the question, the researcher read the responses from the transcribed data and decided accordingly whether the interviewee suggested that he or she had or did not have information about livestock keeping damaging the environment. Responses of "Yes" and "No" were recorded. Answers to the second part of the question that concerned "Reasons for continuation" were also coded and recorded. The researcher assembled data on all material that belonged to each category code and performed preliminary analysis. This whole procedure involved segmenting the information, developing coding categories, and generating categories, themes, or patterns of relationships. These data were later summarized under each code in the individual summary sheets, overall data summary sheets, and the master sheet. Transcription data for public officials were analyzed and summarized in the same manner.

### CHARACTERISTICS OF RESPONDENTS

Two subsections provide a discussion on the characteristics of respondents: urban agriculturalists and public officials.

### Characteristics of Urban Agriculturalists

Table 9 shows the characteristics of respondents selected from the five study areas. Of the 29 interviewees, 19 were female and 10 were males. The age range of respondents was between 20 and 60 years with a mean of 43. The education range was between seven and 18 years (above Form IV or "O" level education) with a mean of 11.6. Respondents family household size range was between four and 13 people and the mean was eight. These figures suggest that over a decade and half, average household sizes in urban areas doing urban agriculture have increased by 60 percent from the average of five people found in 1976/77 by Collier et al. (1986). These people help with urban agriculture chores. Interviews had stayed in Dar es Salaam between three and 40 years with a mean of 15, and they had done urban agriculture between one and 14 years with an average of five years (see Table 9). The surveyed respondents consumed their own urban agricultural daily produce in the range of between three and 25 percent with an average of eleven, figures which suggest that most of the produce is for sale. The range of annual household income from salary was wide: between T Shs 130,000 and 2.7 million (US\$ 271 and 5,625), with a mean of 921,098 (US\$ 1,919).

Table 9 shows that 21 respondents had farms outside Dar es Salaam that ranged in size between three and 35 hectares, with a mean of eight. Table 9 also shows that of the 29 interviewees, ten lived in quasi-medium quality government housing, six in high quality government housing, two in quasi-medium quality own housing, and one in a low quality government housing. Three respondents lived in medium quality own housing and other two in medium quality rented housing. Four interviewees lived in low quality own housing, and

one person lived in low quality rented housing.

Table 9

The Characteristics of Respondents, Dar es Salaam, Tanzania (N = 29)

Characteristic	Number	Range	Mean
Female	19	-	-
Male	10	-	-
Age	-	20-60	43
Years of education	-	7-18	11.6
Household size	-	4-13	8
Years in Dar es Salaam	-	3-40	15
Years of doing urban agriculture	-	1-14	5
% of daily produce consumed in household	-	3-25	11
Annual household net salary income <sup>1</sup> (after taxation) (T Shs)	-	0.13-2.7	0.9 <sup>2</sup>
Annual household net salary income in US\$ ('000)	-	0.3-5.6	1.9 <sup>3</sup>
Size range of farm outside D'Salaam (in hectares)	-	3-35	8
Status of houses:			
High quality govt. housing	6	-	-
Q/medium quality govt. housing	10	-	-
Q/medium quality own housing	2	-	-
Medium quality own housing	3	-	-
Medium quality rented housing	2	-	-
Low quality govt. p/inst. <sup>4</sup> housing	1	-	-
Low quality own housing	4	-	-
Low quality rented housing	1	-	-

<sup>1</sup>In a million Tanzanian shillings, and 30 % is deducted from the annual salary income to derive a net salary income. <sup>2</sup>Represents a mean net salary income for the 25 respondents who received a salary. <sup>3</sup>In 1994, the Tanzanian per capita income was estimated at US\$ 120.00 (World Bank, 1994). <sup>4</sup>Public institution housing.

Table 10 presents data showing properties, items and equipments that most respondents owned some of which helped them in their agricultural enterprise, e.g., one-ton pick-up trucks, bicycle, motorcycle, and sedan cars. All 29 respondents had radios.

Table 10

Properties, Items and Equipment that Respondents (N=29) Doing Urban Agriculture Reported to Own

Property/Item/equipment	Number of respondents reporting to own it	Way of knowing
Radio	29	Observations and interviews
Farm outside Dar <sup>1</sup>	21	Interviews
House outside Dar	19	Interviews
Plot in Dar for building a house	15	Interviews
TV/video cassette	14	Observations and interviews
One-ton pick-up truck	14	Observations and interviews
"Modern" house in Dar	14	Observations and interviews
Saloon car	7	Observations and interviews
Bicycle	6	Observations and interviews
Motorcycle	1	Interviews

Note: <sup>1</sup>Stands for the city of Dar es Salaam.

Table 11 shows the sources of information about urban agriculture that interviewees used. Of the 29 respondents, fourteen got information about agriculture from the MALCD agriculture/livestock extension agents. Most of these fourteen lived in the higher quality housing areas. Fourteen respondents got their information about urban agriculture from private sources such as animal clinics, drug stores, friends, and neighbours.

Table 11

Sources of Information About Urban Agriculture That Respondents (N = 29) Used.

Source of information	Number of respondents reporting as a source
MALCD extension agents	14
Private (i.e., animal clinics)	14
Experience	1
Total	29

### Characteristics of Public Officials

Of the 27 public officials interviewed, 24 were males. Ten worked for the MALCD, of whom three worked at the Dar es Salaam regional agriculture and livestock development office (see Table 12, Appendix 17). Their function was to administer and oversee general agriculture (crop) and livestock extension programmes for the three Dar es Salaam districts: Ilala, Kinondoni, and Temeke. Two MALCD staff members worked at its headquarters, one as an assistant commissioner for agriculture, and the other for livestock development. Three other officials worked at the three district livestock development offices of Ilala, Kinondoni, and Temeke as officers in charge for the districts' veterinary services. The last two MALCD officials worked at the Shabani Robert veterinary clinic in downtown Dar es Salaam in the district of Ilala. One worked as the field livestock extension coordinator and the other as a field poultry extension officer. Five MALCD officials were trained at masters degree levels, three at bachelors levels, and two at diploma levels (see Appendix 17, Table 12).

Seven of the officials worked in urban public health (see Table 12). Of these seven

officials, three worked as lecturers at the University of Dar es Salaam (UDSM) at the Muhimbili campus. One official was the director for the Institute of Public Health of the UDSM and another worked as the director of public health at the Ministry of Health headquarters. One official worked for the Dar es Salaam City Council as the deputy medical officer. The seventh public health official was the project coordinator of the Dar es Salaam Urban Health Project whose offices were in the Dar es Salaam City Council headquarters. Four of these public health officials had received training at masters levels, and three at the post graduate level, that is, at doctoral and above (see Table 12). Urban land use and planning was the area of work for five more interviewees. Of these, three lectured at the Dar es Salaam Ardhi (Land) Institute. The fourth worked at the Ministry of Lands and Urban Planning headquarters, while the fifth worked for the Dar es Salaam City Council as a planning coordinator.

Table 12

Public Officials Interviewed (N = 27) and Their Area of Training, Degree and Diploma Held

Area of training	Ph.D.	M.Sc.	B.Sc.	Diploma	Total	Percent
Agriculture and livestock	-	5	3	2	10	37.0
Urban public health	3	4	-	-	7	26.0
Urban land use and planning	-	2	3	-	5	18.5
Resource assessment (environment)	-	3	-	-	3	11.1
Media (Tanzania Std. Newspapers)	-	-	1	-	1	3.7
Military (but as politician)	-	-	1	-	1	3.7
<b>Total</b>	<b>3</b>	<b>14</b>	<b>8</b>	<b>2</b>	<b>27</b>	<b>100.0</b>

Note: Of the 27 officials, 24 were male and three female.

Three of these five officials had bachelors degrees, and two had masters education (see Table 12). Three officials worked for the National Environmental Management Council (NEMC). All NEMC officials had received masters degrees. Another official worked for a newspaper and had bachelors degree in journalism. The final official interviewed was a military colonel and a long time Member of Parliament (MP), the role in which he was interviewed. He had a bachelors degree in military subjects.

**CHAPTER 5****URBAN AGRICULTURALISTS IN DAR ES SALAAM:  
WHAT THEY DO AND WHAT THEY KNOW**

The key question of interest in the study was why people persist in doing environmentally damaging urban agriculture when they appear to know about the damage it does. Previous chapters have explored the Tanzanian socioeconomic context and the practice of urban agriculture and its damaging effects, this chapter examines what urban agriculturalists themselves do and what they say they do. It shows what information agriculturalists acknowledge having and what information city officials and extension workers claim these people have. The chapter also presents their accounts, and those of extension workers and city officials, of the reasons they have for engaging in practices that are damaging. The chapter draws from four principal sources of information: (a) interviews with twenty-nine urban agriculturalists, (b) observations of their agricultural operations, (c) interviews with agricultural extension workers and (d) interviews with city officials. Details of the interview procedures were presented in Chapter 4 and the interview schedules are shown in Appendices 9, 10, 11 and 12.

The chapter is in four sections. Section one reports what the twenty-nine urban agriculturalists do. The second section describes their beliefs and knowledge about damaging effects of urban agriculture. The third section presents the reasons they give for continuing to engage in the practice in spite of this knowledge. This is followed by a summary and conclusions.

## WHAT URBAN AGRICULTURALISTS DO

This section examines at the activities that agriculturalists engaged in. It draws on both interviews and observations, and where necessary, the text makes clear the sources of the data reported. The first three subsections discuss the keeping of dairy cattle, chickens, and other kind of livestock respectively. The fourth subsection discusses respondents' income from their livestock keeping enterprises. The last subsection describes observed environmentally damaging aspects of keeping livestock.

### Keeping Livestock: Dairy Cattle

Table 13 shows that of the 29 respondents, seventeen kept dairy cattle. Eight interviewees kept from one to four cattle while six kept from five to eight. One person had nine and the two remaining respondents kept more than 12. Appendix 14 also shows that respondents in the high and quasi-medium quality housing areas had more dairy cattle than those in the medium and low quality housing areas. It was also observed that respondents in the former areas kept livestock as economic enterprises even when they had water and space for growing some field crops and vegetables. Seventeen of the 29 respondents kept a total of 105 dairy cattle. Ten had cattle observed to be crossbreeds between the Ayrshire, Boran, Friesian, Guernsey, and Jersey cattle. Five respondents kept dairy cattle that were crosses between the Ayrshire, Friesian, Guernsey, and Jersey, and three had cattle that showed crossbreed traits of the Boran, Friesian, and Tanzanian Shorthorn Zebu.

Table 13

Patterns of Cattle Holdings Among Respondents (N = 29)

Cattle holdings (cows + calves bullocks + bulls)	Number of Interviewees
1 - 4 animals	8
5 - 8 "	6
9 - 12 "	1
More than 12 animals	2
<b>Total</b>	<b>17</b>

Most respondents kept the renowned dairy cattle breeds or crosses of the Ayrshire, Friesian, Guernsey and Jersey. Despite the fact that these are milk breeds, this study found that most people got low yields of milk, an average of 5.3 litres per cow per day (see Appendix 15). In Tanzania, according to Biwi (1992) average yields of eight litres of milk per cow per day are possible, and Laurent and Centres (1990), Swai, Minja and Zylstra (1992) claim that seven and a half litres is possible.

There is ample literature (Chamberlain, 1989; Food and Agriculture Organization (FAO) of the United Nations, 1992; Morungu, 1989; Swai, Minja & Zylstra, 1992; Tambi, 1991) to show that crossbred cattle yield more milk than the local breeds of cattle when their production and maintenance ratios and other conditions are met. And crossbreeds are disease resistant, hardy, heat tolerant and adapt to local conditions in a way that pure exotic breeds do not. It appeared that most respondents were aware of these aspects to judge by the number of crossbreeds they kept. However, it was observed that most dairy cattle received feed that was inadequate to sustain their production and maintenance needs. The

low yields probably resulted from this. For example, the recommended dry matter intake from roughage for the average cow is eight to 12 kilograms of dry matter (DM) per day (Practical Training Centre for Dairy Cattle, 1981, p. 10), an amount that most respondents rarely reached. Most respondents brought fresh cut forage from far away fields in one-ton pick-up trucks and considered it enough for an average of three cows and two calves for three days. This amount is not at all sufficient. Small amounts of maize bran were fed only to milking cows, leaving other animals to go without. In the end, this could affect the phenotypic aspects of most dairy cattle.

Not only did the city bylaws specify that livestock keepers should zero-graze their animals, officials of the City Council had time and again urged compliance. However, the researcher still saw dairy cattle and goats graze around the Oysterbay areas at night. Also, dairy cattle grazed on the open areas and road pavements in the city, and in areas such as Kinondoni Block 41, Masaki, Mikocheni, Oysterbay, and Sinza. Other areas included the University of Dar es Salaam unbuilt land, Kurasini, Ilala, and the Gymkhana golf grounds. These areas showed conspicuous signs of degradation due to livestock activities.

All cows were milked by hand. Of the 29 respondents, 18 employed labourers to take care of their agricultural enterprises. Also, hiring labour was common among people living in high quality government housing and quasi-medium quality housing, especially in households keeping dairy cattle and chickens. Most shed roofs for dairy cattle were made out of used corrugated iron sheets while walls were either made of corrugated bricks, tree bark, used pieces of wooden boards and poles. Most shed floors were concrete.

### Keeping Livestock: Chickens

All commercial chickens raised in Dar es Salaam are for eggs and broiler meat, and consist mainly of the exotic cross breeds. Table 14 shows the range of numbers of chickens (layers and broilers) that respondents kept. At the end of 1993, of the 29 respondents, 25 kept 11,240 chickens (8,570 were broilers, 2,670 layers). Of these 25 interviewees, 16 kept broiler chickens of the white Arbor Acres and Starbro crosses, and nine kept egg-laying chickens of the Shaver Star crosses (see Appendix 15). Of the 25 respondents with chickens, 16 kept from 100 to 400 chickens and were in the majority (see Table 14).

Table 14

Patterns of Chicken Holdings Among Respondents (N = 29)

Chicken holdings (Layers + broilers)	Number of Interviewees
100 - 400 chickens	16
500 - 800 "	6
900 - 1,200 "	2
More than 1,200 chickens	1
<b>Total</b>	<b>25</b>

It was also observed that respondents kept chickens under the deep litter system in which sawdust was a common litter material. Under this system, chickens defecate on the deep litter that owners usually removed after eighteen months. Respondents had chicken sheds with roofs and floors built similarly to those made for dairy cattle. However, most people covered the walls with a one inch square wire mesh, an important aspect for letting out

fumes and odour, and for airing out sheds in the warm climate of Dar es Salaam.

### Keeping Other Livestock: Goats and Sheep

Table 15 shows that of the 29 respondents, 13 kept other kinds of livestock that included ducks, goats, local fowls, rabbits, and sheep.

Table 15

#### Other Livestock That Respondents Kept (N = 29)

Kind of livestock	Total number kept	Number of respondents keeping each kind
Ducks	37	2
Goats	23	6
Local fowls	15	3
Rabbits	7	1
Sheep	4	1
Total	86	13

Of the 13 respondents, six kept a total of 23 goats, three kept 15 local fowls, two kept 37 ducks, and one kept seven rabbits while another kept four sheep. The popularity of goats reflected in Table 15 is at odds with the claim by some urbanites that these animals damaged the urban environment. Appendix 14 shows the distribution of keeping these livestock among respondents in different housing locations. Goats are more frequently kept in the lower density areas than in the higher density ones.

### Earnings From Keeping Livestock

In the built-up areas of the city of Dar es Salaam, most people keep dairy cattle and laying and broiler chickens to earn money. The researcher partly verified this to be so by seeing respondents sell milk, eggs, and broilers to various consumers. The interview data for this study supports this observation. At the end of 1993, the 29 respondents kept 47 dairy cows, 8,570 broiler chickens, and 2,670 egg-laying hens (see Appendix 15). Respondents' reports of their average annual net profit from these enterprises totalled T Shs 36.9 million (US\$ 76,875), with an average annual net profit per respondent of T Shs 1.3 million (US\$ 2,708). The range of individual profit was from T Shs 86,400 (US\$ 180) to T Shs 5,558,400 (US\$ 11,580) (see Appendix 14).

Table 16 shows the ranges of total annual net profits that various respondents earned from the three livestock enterprises. The total net profit from keeping dairy cattle ranged from a low of T Shs 50,000 (US\$ 104) to a high of T Shs 1.6 million (US\$ 3,333), although only one respondent's profit exceeded this amount. The total net profit from keeping broiler chickens ranged from a low of T Shs 50,000 (US\$ 104) to a high of more than T Shs 2 million (US\$ 4,167), a profit that was exceeded by only one interviewee. The picture of profits for keepers of laying chickens is different. The total net profit from keeping laying chickens ranged from a low of T Shs 450,000 (US\$ 938) to a high of more than T Shs 2 million (US\$ 4,167), a profit exceeded by two respondents. This high profit is reflected in Table 17 showing that respondents who kept laying chickens earned per capita 1.7 and 3.6 times more total net profits than those who kept broiler chickens and dairy cows, respectively.

Table 16

Ranges of Total Annual Net Profits Earned From Urban Agriculture Among Respondents (N = 29)\*

Range of earnings (T Shs '000)	Of urban agriculture products		
	Milk	Broiler meat	Eggs
	Number of respondents reporting the earnings		
50 - 249	4	2	-
250 - 449	4	1	-
450 - 649	6	5	2
650 - 849	1	3	2
850 - 1,049	-	1	-
1,050 - 1,249	-	-	2
1,250 - 1,449	-	2	1
1,450 - 1,649	1	1	-
1,650 - 1,849	-	-	-
1,850 - >2,049	-	1	2
Total	16	16	9

\*One respondent had heifers that were not in production, but kept layers and broiler chickens.

Table 17 further presents earnings data for each enterprise at the end of 1993. Sixteen respondents who kept 25,710 broilers per year (i.e., 8,570 birds multiplied by three batches/year) earned a total annual net profit of T Shs 15 million (US\$ 31,250). This figure yields a mean net profit calculation per person of T Shs 946,000 (US\$ 1,971). This figure is 14.8 times the total net annual salary of T Shs 64,800 (US\$ 135) of a low income worker, and 5.6 times that of T Shs 168,000 (US\$ 350) of a senior public official.

Table 17

Total Annual Net Profits<sup>1</sup> of Respondents (= 29) Made From Three UA Enterprises (as of September, 1993) Compared With Salary Incomes

UA enterprise and mean salary	No. of respondents	Amount of produce/yr.	Unit price <sup>2</sup>	Total net profit (T Shs)
Sale of broilers	16	25,710(birds)	0.8-1.0	15,138,000 <sup>3</sup>
Sale of milk	16	60,000(litres)	0.2	7,200,000 <sup>4</sup>
Sale of eggs	9	21,600(trays)	1.2-1.1	14,548,000 <sup>5</sup>
Total salary mean annual net income: of a senior official, and of a low income worker				168,000 <sup>6</sup> , 64,800 <sup>7</sup>

Note. <sup>1</sup>Total annual net profits are figures after deducting 40 percent of the operational costs. <sup>2</sup>Unit price is in a thousand of T Shs. <sup>3</sup>Total annual net profits from broiler chicken are based on keeping three batches of broiler chickens per year. <sup>4</sup>Total annual net profits of milk sales are calculated based on an eight (8) month (240 days) lactation period for cows. <sup>5</sup>Total annual net profits of sale of eggs are calculated based on annual production of eggs. <sup>6</sup>The income of a senior official is a result of multiplying T Shs 20,000, a salary per month with 12 months and deducting from the total 30 percent for taxes. <sup>7</sup>The income of a low income earner is the result of multiplying T Shs 6,000, a salary per month with 12 months and deducting from the total 30 percent for taxes.

The other sixteen respondents who kept 47 dairy cows and sold fresh milk earned total annual net profits of T Shs 7.2 million (US\$ 15,000). This yields a mean net profit per person of T Shs 450,000 (US\$ 938) (see Appendix 15). This figure was 6.9 and 2.7 times more than the net annual salary income of a low income worker and a public official, respectively. Data presented in Table 17 shows that respondents who kept egg-laying chickens earned the most money. However, some interviewees appeared to diversify these earnings by keeping a combination of enterprises, an aspect explored in Table 18. Table 18 shows that of the 29 respondents, 12 kept four combinations of livestock enterprises. Of the 12 respondents, four kept a combination of cows and egg-laying chickens that earned them total annual net profits of T Shs 9.3 million (US\$ 19,375).

Table 18

Respondents' (N = 29) Combinations of Livestock Enterprises and Their Total Annual Earnings (in T Shs '000)

Combination of livestock	Number of respondents	Total net annual profit ('000)	Total net annual mean profit ('000)
Broilers + cows + layers	1	1,757	1,757
Broilers + cows	3	4,464	1,488
Cows + layers	4	9,342	2,336
Layers + boilers	4	8,611	2,153

This yield of an average net profit per person of T Shs 2.3 million (US\$ 4,792) was the highest mean earning of all four combinations. This income was 36 times the total net annual salary income of a low income worker and 13.9 times that of a senior public official. The other four interviewees kept a combination of egg-laying and broiler chickens and they earned total annual net profits of T Shs 8.6 million (US\$ 17,917). The per person average annual net profit is T Shs 2.1 million (US\$ 4,485). This income was 33 times the net annual salary income of a low income worker and 12.8 times that of a senior public official.

Table 19 compares the number of agriculturists who fell in various earning ranges for each of the two categories of (a) salary from employment and (b) earnings from urban agriculture. Earnings from urban agriculture are shown across the top of the table and those from employment down the left. Solid lines divide each set of figures into "low" "medium" and "high" income ranges. The figures which appear in the table at the intersection of two earnings categories represent the number of respondents who had earnings at the levels shown for each category.

Table 19

Respondents' Total Annual Earnings (in T Shs '000) From Urban Agriculture and Employment Salaries

	Earnings from employment	Earnings from urban agriculture										
		Low			Medium			High				
		50-249	250-449	450-649	650-849	850-1,049	1,050-1,249	1,250-1,449	1,450-1,649	1,650-1,849	1,850->2,049	Row total
	No salary	-	1	2	1	-	-	-	-	-	-	4
	50 - 249	2	-	2	-	-	-	-	-	-	-	4
Low	250 - 449	-	1	1	-	-	-	-	-	-	1	3
	450 - 649	-	-	-	-	-	1	-	-	1	1	3
	650 - 849	-	-	-	-	-	-	-	-	-	-	0
Medium	850 - 1,049	-	1	1	1	1	-	1	1	-	1	7
	1,050 - 1,249	-	-	-	-	-	1	-	-	-	-	1
	1,250 - 1,449	1	-	-	-	-	-	-	-	-	2	3
	1,450 - 1,649	1	-	-	-	-	-	1	-	-	-	2
High	1,650 - 1,849	-	-	-	-	-	-	-	-	-	1	1
	1,850 - >2,049	-	-	-	-	-	-	-	-	1	-	1
Total		4	3	6	2	1	2	1	2	2	6	29

Examination of the details in the Table shows that earnings are distributed across low, medium and high ranges in both categories. A general picture of a relationship between the two categories emerges, however, when one looks at the numbers in the low, medium and high categories. The low salary group includes people who were unemployed and had no income from salary. These four people all had low agriculture earnings. As is the case for all salary groups, there were some respondents in the low salary group who had high

earnings from agriculture. Examination of the proportion of those in each salary group earning low, medium and high incomes from agriculture yields the following results:

- (a) Of the 14 respondents having no or low salary, ten (71 percent) also have low agricultural earnings and only three (21 percent) have high agricultural earnings.
- (b) The eight respondents in the medium salary range are evenly distributed across the three ranges of agricultural earnings (low 25 percent, medium 37.5 percent, high 37.5 percent).
- (c) Of the seven respondents in the high salary range, five (71 percent) also have high earnings from agriculture.

In spite of the small number of respondents of this study, these findings appear to support other studies done in Tanzania, especially in Dar es Salaam that earnings from urban agriculture show a positive relationship with socioeconomic status, capital, and the infrastructure. The data reported in Tables 16, 17, 18 and 19 also appear to support other claims made both by respondents and literature, that urban agriculture was mainly done to earn money and relieve them of the economic austerity they endured. The analyses of urban agriculturalists' total net profit earnings also appear to support data presented in Table 7 in Chapter 3 that most urbanites doing urban agriculture earned higher incomes than that received from their formal salaries.

#### Observations of Environmentally Damaging Aspects

Both crops and livestock activities appeared to damage the environment and the severity

of damage depended on their locations and management. In some respondents' compounds, cattle and goats had damaged the crops and flowers that people grew, especially if owners left their animals to wander about. One respondent remarked:

For example, Oysterbay is now a dirty place, because goats and cattle devour hedges and fences. See, my own cattle ate my flowers outside our house. All my beautiful flowers have been eaten by cattle because the herdsman leaves the animals to roam about the compound. For example, we do not have plantains because the herdsman leaves animals to eat them. . . . (Respondent No. UAs 06, Response No. 364, p. 57).

Of the 29 respondents surveyed, 23 households had animal dung around their compounds, contributing to environmental degradation. Of the nine respondents with only dairy cattle, six had animal dung rotting beside fences or hedges. This was also true for six of the nine interviewees who kept a combination of dairy cows and chickens (for eggs and broiler meat). Most respondents said that they piled animal dung so that they could later sell it to people growing amaranths. However, these people had violated section 6 of the Dar es Salaam City Council bylaws of 1990 (Disposal of Refuse). This section says that "No person shall throw or deposit or cause to be thrown or deposited in or upon any street or other public place any accumulation of dust, refuse, garbage, decaying animal, vegetable, or noxious matter" (United Republic of Tanzania, 1990c).

Of the nine cows' sheds, three had accumulated animal dung mixed with urine and looked like kraals found in rural areas. In the wet season, this mixture formed slurry and pools of dirty water in the drainage ditches, roadside, parks, pavements, and in house compounds. According to claims made by public personnel and some urbanites, these areas became the resting and breeding sites for the malaria-causing mosquitoes of the *Culex* specie. In the dry season, the animal dung dries out, contributing to dust and smell, but the smell is worse

during the wet season. This system for keeping livestock is detrimental to animal health and damaging to the urban environment with the exception of six respondents who owned their housing and had built good permanent cattle sheds. Most people built sheds for dairy cattle with makeshift materials, contributing to the ugliness of the city. This was found in all classes of housing--government, public institution, company, and rented houses. Goats also grazed along the Kinondoni cemetery, the Mandela road near the Radio Tanzania broadcasting station, the Mwananyamala areas, the Pugu road, and the Ubungu areas. Goats had devoured most of the hedges in residential areas causing extensive damage to the urban environment.

The chickens' deep litter systems also contributed enormously to odour problems because the chicken droppings contain uric acid. The problem was made worse by overflowing gutters and leaky roofs. Chickens are also noisy which was a nuisance to neighbours, especially in medium and low quality housing. It was observed that of the 20 interviewees keeping chickens, 15 had chicken waste disposed of in their compounds, either piled up somewhere or scattered around the shed. In these compounds, there was a foul smell. However, most respondents claimed that the chicken manure piles were for sale to people growing amaranths. Still others said that they planned to take it to their distant farms. The researcher paced the average distances from the rear main doors to the animal sheds. The distance appeared to depend on the density of the housing--sheds were 27 metres on average away from the house in high quality housing, and 16 metres in quasi-medium quality housing. They were nine metres away in medium quality areas, and a mere 3 to 4 metres in low quality housing. Respondents' enterprises produced things such as stench, noise,

fumes, and dust, and people living in low and medium quality housing clearly suffered most.

Given these observations, it would appear that in the city, environmental degradation due to urban agriculture is ubiquitous and could escalate if steps to improve it are not taken. To achieve this, it is important to take stock of what kind of information about the damaging aspects of urban agriculture most agriculturalists have. The next section tackles this issue.

### THE DAMAGING EFFECTS OF URBAN AGRICULTURE: BELIEFS AND KNOWLEDGE

This section has three subsections. The first subsection looks at the opinions of the twenty-nine urban agriculturalists about environmental damage resulting from keeping livestock and the bases for their beliefs. Subsection two discusses the views of public officials on whether urban agriculturalists had information about the damaging effects of their practices. The last subsection gives a summary of the views of the two groups.

#### The Opinions of the Twenty-Nine Urban Agriculturalists

This subsection discusses the opinions of urban agriculturalists about five issues or kinds of environmental damage resulting from keeping livestock. It also considers the bases for their beliefs. The issues are those already identified in Chapter 4: psycho-social, socio-political-legal, and those related to disease-health, accidents, and city-landscape.

Psycho-social issues. Table 20 shows the number of respondents who expressed

agreement with statements about the psycho-social issues of environmental damage. The Table also shows how many reported various bases for their beliefs. Most respondents agreed that animals caused noises and odour, and disturb urbanites. About half the respondents concurred with the statement that keeping pigs in areas inhabited by Muslims was not ideal. However, less than half the respondents agreed with the statement that animals scared children in the city.

Table 20

Number of Urban Agriculturalists (N = 29) Concurring With Statements About Psycho-Social Damage and the Basis for Their Beliefs

Focus of question	Number of respondents concurring	Basis for belief mentioned in the response (No. of respondents who said so)
Animals cause noises and odour.	23	Personal experience (23) "Everyone knows" (7) Complaints from neighbours (6)
Animals disturb urbanites.	22	Personal experience (22) Complaints from neighbours (8) "Everyone knows" (6)
Keeping pigs in areas inhabited by Muslims is not ideal.	15	Personal experience (14) "Everyone knows" (5) Complaints from neighbours (4)
That animals scare children.	12	Personal experience (12)

For all four statements, the respondents' main bases of their beliefs was personal experience. However, as respondents' transcript data show, some interviewees mentioned more than one basis for the belief. Other bases for their beliefs mentioned other than personal experience included "everyone knows" and "complaints from neighbours."

A fuller understanding of the respondents' views is given by examining some of their comments. On the issue of complaints about noises, fumes, and odour that animals caused,

for example, one respondent said:

I might have earlier answered this question when I was discussing other issues but I agree with those claims. I should now say that I don't feel good about keeping animals in the city. It would subject my neighbours to noises, fumes, and odour and they rarely come to talk to me, in spite of the gossip that goes around (Respondent No. UAs 12, Response Nos. 665 & 666, p. 106-107).

Another explained:

Yes, it is true that those who keep animals are aware that their animals cause noises and odour that bother the neighbours. For example, there was a time when my neighbour had local chickens that were left on a free range. They used to eat my vegetables and I had to complain about that to him. He immediately restrained his birds because he knew that he was faulty. People know that they have to control their animals and keep their shed clean to avoid being bothered by neighbours and the City Council (Respondent No. UAs 01, Response No. 26, p. 4).

It would appear that noise, fumes and odour from livestock are particularly critical in the high density areas. This is in part because of lack of space and partly due to poor management at certain times of year. As one interviewee said:

It is true that animals can sometimes cause noises and animal manure can cause areas to stink. However, this is only common during the rainy seasons. The thing to do is clean the shed ensuring that all animal manure is disposed of away from the houses. Here, if I do not clean regularly the deep litter of saw dust, it usually smells (Respondent No. UAs 24, Response No. 1414, p. 226).

In spite of the majority view, six respondents said that they did not believe that people complained of noises and odour that animals caused. Some people said that it was not true because most livestock keepers cleaned thoroughly the animal shed and sold the animal manure to people growing amaranths, before it became odorous. Still others said that some livestock keepers had one-ton pick-up trucks that they used to ferry animal manure to their peri-urban farms. One interviewee commented:

I have not experienced any complaints of animals causing noise and odour in this area because most people keep their chicken houses and cattle shed clean. For example, most people around here have transportation that they use to ferry animal manure to the peri-urban farms (Respondent No. UAs 02, Response No. 94, p. 15).

With respect to the statement that animals caused disturbances to urbanites, one woman respondent explained:

I agree with those claims, especially with keeping cattle, goats and local chickens. Some people let their animals roam freely. They eat people's vegetables and defecate everywhere. I think that is not fair to other urbanites and such animals should always be kept inside (Respondent No. UAs 19, Response No. 1083, p. 176).

Another agreed:

Yes, I agree with those claims, especially with animals such as cattle if they are left to wander about to graze (Respondent No. UAs 16, Response No. 913, p. 147).

Part of the problem of animals disturbing urbanites appeared to stem from the declining amount of grazing areas. As noted during the study, this was partly due to an increased number of livestock per household and the inability of keepers to provide them with enough forage. As one interviewee remarked:

Yes animals disturb urbanites. I do not see why that should not be the case when grazing areas in the city have dwindled. Although they insist that people should zero-graze their animals, it is still hard on some. You must have seen animals grazing along the roads and disturbing pedestrians and motorists (Respondent No. UAs 05, Response No. 259, p. 41).

Another commented:

Yes, it is true that animals disturb urbanites, particularly cattle. These animals produce cow dung that stinks and disturbs other people. It is better if the people who keep more than the recommended four animals are advised to move them to the peri-urban areas . . . You see these areas of Oysterbay, Msasani, and Masaki are not meant for keeping livestock. There are simply no areas for grazing all the cattle we have. In these areas it could be okay if people kept one or two animals (Respondent No. UAs 02, Response Nos. 85 & 86, p. 14).

As Table 20 shows, although it was the majority view that animals disturbed people, seven interviewees did not believe it was true. They said it was impossible that animals could disturb other people when they were kept in the livestock keepers' compounds under zero-grazing. They also insisted that most livestock keepers thoroughly cleaned their sheds; and

either sold the animal manure to amaranths growers, buried it in the gardens, or took it to the peri-urban farms. Other interviewees explained that not only did they not agree with the statement, but that it was a malicious claim made out of jealousy by people who did not keep livestock:

It is not true that animals disturb urbanites and those complaining about this do not even keep animals. I think it is a malicious claim that people not keeping livestock make. There are some who do not want to see animals around. And they are like couples without children who do not want to see other people's children playing in or around their compounds (Respondent No. UAs 09, Response No. 489, p. 77).

Keeping pigs in the residential areas may be particularly offensive to Muslims. As Table 20 shows, about half the interviewees agreed that keeping pigs in areas with Muslims was not ideal. Some respondents appeared not to recognize the potential for religious offence. They spoke only of odour and waste. As one interviewee explained:

Personally, I do not see any problem with it if pigs are well kept and the pens are always cleaned. This means that one should restrict pigs to their pens and take all the manure away from the compounds. However, it appears that the concern of most people is the odour produced from the piggery, and that is difficult to prevent in the neighbourhood (Respondent No. UAs 26, Response No. 1508, p. 241).

However, other interviewees' responses about keeping pigs in the city appeared not to be in line with the above quotation, as one respondent's views suggest:

Although I wanted to keep pigs here, my friends and neighbours warned me not to attempt it because they can pollute the place with their smell. I then stopped carrying out the idea. I am planning to keep pigs in Ukonga where I will be moving to live (Respondent No. UAs 07, Response No. 383, p. 59).

Fourteen interviewees, disagreed that pigs should be avoided in Muslim areas. Some respondents again seemed not to see the religious issue and said that it was not a problem if owners kept the pigsties clean and ferried the manure out of their compounds. Other

interviewees saw the point, but said that in the city there were no areas for the Muslims alone and nobody could dictate what individuals did within their plot limits. As one respondent stated:

I want to consider this issue of keeping pigs, dairy cattle and other animals as uniform. I think people should be allowed to keep any kind of animals that suits them in all area despite of their religion beliefs. What I disagree with is to force Muslims to eat pork and none has done that in this country. The Koran does not even discuss the issue of keeping pigs in areas with Muslims (Respondent No. UAs 08, Response No. 435, p. 68).

Only twelve interviewees agreed with the statement that keeping livestock in the city, especially cattle, scared children. One respondent elaborated on this as:

Those claims are true depending on the period in question. Some years back there were not any dairy cattle kept in the city and most children here had not seen a cow. The children then were scared of animals if they happened to come across one (Respondent No. UAs 08, Response No. 428, p. 67).

Over half the respondents disagreed with the view that animals scared children. Some said that they heard it said but thought that it was not true because most areas had cattle and children often saw them, thus dispelling the fear. In addition, respondents said that they doubted the information they heard because most animals were zero-grazed and if they happened to graze outside, herdsman looked after them. Still others questioned the statement and said that it was not a problem in their neighbourhoods because most people kept their animals stall-fed.

Socio-political-legal issues. Three statements on socio-political-legal issues were put to respondents. Table 21 shows the number who expressed agreement with them and the bases for their beliefs. Most respondents agreed with the statement that urban agriculture

persisted in the city because the city bylaws were not enforced. More than half the interviewees expressed agreement with the statement that some animal owners used official time to look after their animals. Fewer than half the respondents concurred with the statement that some politicians had condemned urban agriculture in the city.

Table 21

Number of Urban Agriculturalists (N = 29) Concurring With Statements About Socio-Political-Legal Damage and The Basis for Their Beliefs

Focus of question	Number of respondents concurring	Basis for belief mentioned in the response (No. of respondents who said so)
Urban agriculture persists because bylaws are not enforced.	24	Personal experience (24) "Everyone knows" (15) Complaints from neighbours (2) City Council Staffs (2) Through the radio (2)
Animal owners use "official" time to look after their animals.	18	Personal experience (18) "Everyone knows" (9)
Some politicians have condemned urban agriculture.	14	Personal experience (14) "Everyone knows" (3)

The respondents' main bases for their beliefs was personal experience, and minor bases included "everyone knows," complaints from neighbours, city council staffs, and hearing it through the radio. It is interesting that the topic of bylaw enforcement evoked mention of more bases for their beliefs than any other. Comments from those in agreement with the statement that bylaws were not enforced included the following:

I personally think that most people know about the city bylaws that regulate urban agriculture, and most break them with the impunity . . . Yes, I do think most know because it was announced in the mass media (the radio and the newspapers) . . . (Respondent No. UAs. 04, Response No. 32 & 33, p. 5).

I agree with that claim that most people who know about the city bylaws are disregarding them.

This is happening in most parts of the city, and it also applies to people keeping animals. That is why there are livestock everywhere in the city (Respondent No. UAs 26, Response No. 1515, p. 242).

It is true that most people who do urban agriculture are aware of the City Council's bylaws. For example, the people have knowingly surpassed the number of four cattle that the City Council allows to be zero-grazed (Respondent No. UAs 21, Response No. 1223, p. 198).

Five respondents disagreed with the statement and said that the City Council was enforcing its bylaws and as a proof, the Council occasionally impounded people's livestock (cattle, goats) that were found grazing about in the city.

Another statement that more than half the interviewees agreed with was the statement of some citizens claiming that animal owners used "official" time to look after their animals.

One respondent illustrates the point:

Yes, people use official time to look after their animal activities. For example, one may need to pick up day old chicks from the hatchery during work hours. Sometimes the people pick up extension/veterinary workers to go and look after their sick chicks, laying hens or cows. I also do that, a fact I cannot deny (Respondent No. UAs 04, Response No. 206, p. 32).

In the city, casual evidence suggests that some formally employed women quit their jobs partly because they could no longer continue to use "official" time to look after their urban agriculture enterprises. However, this problem is not over yet as most of the employed people who are aware of this problem appear to use "official" time for their sideline enterprises with the impunity. In this vein, one interviewee gave a typical comment:

I personally quit formal work to look after my enterprises. For those who are working and take time off to look after their enterprises, there is an element of deception. I quit work because I did not want to lie to the government when these urban agriculture enterprises required close supervision. . . . For most people formally employed this means often taking official time to look after their enterprises' chores (Respondent No. UAs 15, Response No. 850, p. 137).

Of the 29 interviewees, 11 said they disagreed with the statement that city livestock

owners used official time, and they did not believe it. They gave various reasons. Some said that it was impossible for most people to use official time in their urban agriculture chores because they attended to their urban agriculture activities in the evenings i.e., after work hours and week-ends. Others said that most people had employed labourers (i.e., herdsmen) or had relatives who helped them in their urban agriculture activities. Still others said that the government had abolished Saturday as a work day to free the time for people to look after their urban agriculture activities. Yet, others mentioned the government policies of mid 1980s of trade liberalization and privatization that had made easy the availability of agricultural inputs that were scarce. These inputs included the animal feed and medications, plant chemicals, and acaricide sold in private drug stores, farm shops, and animal clinics. Furthermore, others disagreed with the view and said that most people who looked after the urban agriculture activities were women, and included those retired from official jobs, home makers, business people, or others who had voluntarily quit salaried jobs.

The government appears to encourage urban agriculture partly due to its food self-sufficiency philosophy and for the people to earn some income. However, at times, some politicians and bureaucrats had openly criticized certain practices of urban agriculture such as those involving keeping cattle and goats. It was in this context that respondents were asked to give their opinions about a statement that some politicians condemned urban agriculture. For example, one respondent agreed:

I know that politicians have condemned, for example, those people who let their animals out to graze. Politicians encourage people to keep animals in specially built sheds and under zero-grazing (Respondent No. UAs 12, Response No. 676, p. 108).

Another explained:

I know for example that most politicians have urged people to keep animals inside and make sure that their surroundings are cleaned . . . (Respondent No. UAs 19, Response No. 1100, p. 178).

Another remarked:

Some politicians have condemned animals left to graze about in the city. The friction occurs when some people keep more than four animals and do not zero-graze them as politicians urge (Respondent No. UAs 01, Response No. 41, p. 6).

In the city, most people faced difficulties in surviving and in essence these conditions led most politicians to condone urban agriculture for alleviating the situation. For example, politicians found it hard to condemn urban agriculture in a city facing a 26 percent inflation rate, a population growth rate of 3.2 percent, and a decline in people's real incomes every year. These conditions forced most politicians to also do urban agriculture even when they knew of its damaging effects. As one respondent explained:

I think it is unrealistic for politicians to condemn urban agriculture. For example, it is necessary to keep cattle in the city because the Tanzania Dairy Plant at Ubungu has never satisfied the demand for milk. Also, it is not easy for a person who does not keep broiler chickens to afford to eat meat even three times per month. A low income earner cannot afford to spend T Shs 1,000 (US\$ 2) to buy a broiler chicken. A person like myself can just grab one broiler from my shed. Also a person may have a young child requiring milk and the canned milk formula sells at T Shs 2,000 to 2,500 (US\$ 4 to 5). A grown child will drink that much milk in four or five days. With the same T Shs 2,000 (US\$ 4) one can buy enough cow's fresh milk to feed a child for ten to 15 days. So, the politicians and the public who complain about these activities do not consider the benefits derived from urban agriculture. They do not know most people keep livestock so that their families can get meat, milk and money to buy other household essentials (Respondent No. UAs 20, Response No. 1165, p. 189).

Of the 29 respondents, more than half disagreed with the statement that some politicians had condemned urban agriculture. Some countered the statement and said that most politicians exhorted people to keep four dairy cattle under zero-grazing. Others who objected to the view gave proofs to show that politicians were in the forefront for doing urban

agriculture. As one interviewee said:

On the contrary, politicians have not condemned urban agriculture. Most politicians do it by keeping dairy cattle and chickens, and I think they just talk about it but do not carry it out. I guess you have been around in the Oysterbay, Masaki and Msasani areas and the livestock you saw in those areas are kept by politicians and senior government officials (Respondent No. UAs 02, Response No. 101 & 102, p. 16).

Disease-health issues. Table 22 shows the number of respondents who expressed agreement with statements related to disease-health issues of environmental damage and the various bases for their beliefs. Over half the respondents agreed with the statement that animal dung in the city was unhealthy.

Table 22

Number of Urban Agriculturalists (N = 29) Concurring With Statements Related to Disease-Health Damage and the Basis for Their Beliefs

Focus of question	Number of respondents concurring	Basis for belief mentioned in the responses (No. of respondents who said so)
Animal dung in the city is unhealthy.	19	Personal experience (14) Other people say (7)
Animals can transmit diseases such as anthrax, brucellosis and tuberculosis to humans.	11	Other people say (10) Personal experience (2)
Animals cause pollution of ground water.	6	Other people say (3) Personal experience (2) Through the radio (1)
Animals are responsible for the increase of malaria in the city.	5	Other people say (4) Personal experience (2) Through the radio (1)

Eleven interviewees concurred with the statement that animals can transmit diseases such as anthrax, brucellosis and tuberculosis to humans. Fewer than half the respondents agreed with the statements that animals caused pollution of ground water and that animals are

blamed for increase of malaria in the city. The respondents' main bases for their beliefs to most issues of damage were personal experience, "other people say," and the radio was mentioned, albeit infrequently. The following interviewees' quotations shed more light about issues related to disease-health damage. One serious problem of doing urban agriculture was the inability of the people to dispose of animal dung. To this, one respondent remark:

Of course, animal dung is unhealthy. There is no doubt in my mind that animal dung is the precursor to some common city ailments (Respondent No. UAs 05, Response No. 281, p. 44).

Another concurred:

Personally, I agree that animal dung produces fumes and odour that affect people. It is my experience that if the shed is not cleaned, a terrible smell is produced which does affect me too. I sometimes think that there are some diseases that attack chickens that can also attack humans (Respondent No. UAs 28, Response No. 1636, p. 260).

Still another said:

I agree that animal dung is unhealthy in the city because it is claimed to cause tetanus. Take the example of cattle that freely roam and defecate in the children's playground where children can get infected with tetanus. This could have fatal consequences. I personally do not agree that animals should be left grazing about although I keep cows here (Respondent No. UAs 21, Response No. 1168, p. 190).

In the city, animal dung was associated with the deadly disease called tetanus. Although, some respondents agreed that animal dung was responsible for the increase of tetanus in the city, they could not offer concrete proofs. As one interviewee's comments suggest:

It is true that animal dung is not a good thing in the city because it causes tetanus. However, I do not have data that would prove that the increase of tetanus is due to animals . . . (Respondent No. UAs 17, Response No. 990 & 991, p. 159).

However, ten interviewees disagreed that animal dung was all that bad and they fall in two groups. First, those who also did not believe that animal dung caused any harm to the city.

One interviewee said:

Personally, I do not see how cow dung can cause problems in the city because I do not have evidence to support those claims (Respondent No. UAs 01, Response No. 44, p. 7).

Second, were those who disagreed and found ways to discredit the statement. They said that they were amazed that some people complained about animal dung when most were born and raised in rural areas of Tanzania where animal dung is ubiquitous. For example, one respondent said:

Dung produced by cattle and goats are commonplace to most Tanzanians and I would not expect them to complain about that. I would expect those complaints to come from non Tanzanians because most of us grew up in rural areas where the animals were everywhere (Respondent No. UAs 11, Response No. 628, p. 99).

In the city, although animal dung appeared to have several disadvantages, some respondents still disagreed that it caused certain diseases. They said that if that were so, the pastoralists Maasai would have died of the diseases animal dung caused. One interviewee stated:

However, I do not think that claims some people make that animal dung causes tetanus are true. If some of those claims were true, I think the Maasai who keep large herds of cattle would have died of tetanus. . . . (Respondent No. UAs 08, Response No. 451, p. 71).

Yet, another group of interviewees said that if it was true that cow dung damaged the environment it did not concern them. They said that it could be so in other people's compounds and not in theirs even when evidence suggested that they also did the damaging urban agriculture.

Evidence suggested that most people had little knowledge about keeping livestock, which was revealed by looking at the conditions under which livestock, especially cattle and chickens, were kept in the city. It was in this context that the likelihood of animals passing certain diseases to humans could increase. For example, eleven interviewees agreed with the statement that animals could transmit diseases such as anthrax, brucellosis, and

tuberculosis to humans. One interviewee said:

This is true and the answer is similar to what I said earlier. Sometimes we say no to aspects that we do not understand. For example, we constantly treat our milking cows with imported antibiotics. Those drugs may be finding their way into people's bodies and likely to cause diseases. However because of our poverty, these issues appear a luxury when they may have contributed to our knowledge of these diseases and their causes (Respondent No. UAs 05, Response No. 287, p. 45).

Since some respondents vaccinated their animals, it was apparent that they had information about animals transmitting diseases to humans, as one interviewee suggested:

Those claims are true and we normally vaccinate the cattle and chickens to protect them against those diseases (Respondent No. UAs 15, Response No. 868, p. 140).

Another who tested cattle for diseases, said:

I agree with those claims and you may have noticed that most cattle have a round metal disc in one ear. That shows that they have been vaccinated against anthrax, brucellosis, and tuberculosis. For example, we did further tests for those diseases at Sokoine University of Agriculture in Morogoro (Respondent No. UAs 20, Response No. 1173, p. 191).

However, other agriculturalists disagreed with the statement and said they did not believe it was true because there were veterinary doctors and livestock extension workers who often checked their animals for diseases. Others said that if it was true, ethnic groups such as the Maasai, Gogo, and Sukuma who have kept cattle for time immemorial would have died of those diseases. Still others said that most people who bought their milk were literate and boiled it, thereby eliminating chances of disease transmission.

From a health point of view, animal dung can cause an increase of nitrates in the ground water. And if consumed by young children, it can cause cirrosis or the blue baby disease called *methaemoglobinaemia*. One interviewee remarked:

This depends on the number and species of animals kept and the type of soil. If the water table is shallow, animal activities can pollute the ground water (Respondent No. UAs 02, Response No. 110, p. 17).

Some respondents who had lived in rural areas appeared to reflect upon their experience, as one interviewee put it:

I think that is true, although it is not common in Dar es Salaam. In the village where I came from that could be a problem if animals drank the same water used by the people (Respondent No. UAs 14, Response No. 782, p. 126).

The boundaries of the city of Dar es Salaam, like most cities in developing countries, are expanding rapidly despite lack of the infrastructure. It appeared that these new areas were increasingly being used for urban agriculture such as keeping cattle and goats, and some owners were presumed not aware that they damaged the pristine surroundings. For example, one interviewee commented:

Those claims are true for wells that people do not protect. Animals can also transmit diseases to humans if they drink the same water used by the people. This problem is now becoming common in areas of Dar es Salaam where piped water is not available, for example, the new areas of Ukonga and Kigamboni (Respondent No. UAs 26, Response No. 1526, p. 244).

But some interviewees disagreed with the view saying that most people were using tap water as the following comments suggest:

That is not a problem in the city because we use piped water (Respondent No. UAs 07, Response No. 403, p. 63).

That could be a true claim in rural areas because most people here use piped water (Respondent No. UAs 01, Response No. 52, p. 8).

Yet, respondents forgot that in the city, about 75 percent of the population lives in areas where the infrastructure, including water, has not been improved. For example, in the most densely populated high density areas of Buguruni and Manzese, most people draw water from shallow wells that could be polluted from poor ways of keeping cattle and growing amaranths.

In the city, it appeared that the extent to which livestock could increase the disease-causing mosquitoes was enormous. For example, Table 6 on page 65 shows that from 1985 to 1993, cattle numbers in the city had increased by 451 percent (56 percent increase per annum). This figure suggested that malaria might have been on the rise due to keeping cattle. However, as Table 22 shows, of the 29 respondents, only five agreed with the statement that animals are blamed for the increase of malaria in the city. One respondent concurred:

I think that this claim is true and that is why I approve of zero-grazing animals (Respondent No. UAs 22, Response No. 1303, p. 210).

Another echoed:

I think it true that animals can cause the increase in malaria if they are left to graze outside . . . (Respondent No. UAs 29, Response No. 1708, p. 271).

Another linked other harmful causes of animals to that of malaria:

I think this is a problem because if you consider that animals cause the increase of flies, the same can be true for mosquitoes (Respondent No. UAs 28, Response No. 1639, p. 261).

Despite malaria being a common disease in the tropics, some interviewees said that they did not believe the statement. One respondent underscored this point as:

I do not agree with claims that animals have caused the increase of malaria in the city (Respondent No. UAs 03, Response No. 161, p. 25).

Others disagreed with the view and said that malaria had been in the city even before animals came, as one respondent put it:

I think that is not a problem because malaria started a long time ago, even before cattle were kept in the city. Nor does growing crops such as plantains aggravate malaria (Respondent No. UAs 07, Response No. 402, p. 62).

Still other interviewees disagreed with the statement and cited the city's filthy conditions that

abounded as factors increasing malaria. Like most cities in developing countries, Dar es Salaam is filthy with stagnant water, garbage, overflowing sewage, dust, broken drainage ditches, and bushes, all seen everywhere. In many ways, these conditions also favour the breeding of malaria-causing mosquitoes and other harmful pathogens. It appeared that some respondents also knew about these conditions and used them as proof to disagree with the statement. One interviewee gave a typical comment:

I do not think that is true . . . Everyone knows that the source of malaria in the city is the broken and clogged drainage channels. The drainage channels have not been maintained for so long that they have become areas for holding dirty water in which the malaria-causing mosquitoes breed. There are also potholes and open cans, among other things, which all act as breeding areas for the malaria-causing mosquitoes. So, you can see that malaria in the city has no correlation with the presence of animals (Respondent No. UAs 09, Response No. 511, p. 81).

Accident issues. Table 23 shows the number of respondents who expressed agreement with statements related to accident environmental damage and the various bases for their beliefs.

Table 23

Number of Urban Agriculturalists (N = 29) Concurring With Statements Related to Accident Damage and The Basis for Their Beliefs

Focus of question	Number of respondents concurring	Basis for belief mentioned in the responses (No. of respondents who said so)
Animals in the city cause traffic jams that lead to accidents.	27	Personal experience (26) "Everyone knows" (10) Other people say (2)
Animals can sometimes cause bodily harm to humans.	24	Personal experience (23) Other people say (1)
Animals sometimes hurt pedestrians, children, old and sick people.	23	Personal experience (19) Other people say (4)
Animals rub themselves on electricity poles, making them fall down and cause electric shock to humans.	5	Personal experience (4) "Everyone knows" (2) Other people say (1) "Everyone knows" (2)

Most interviewees expressed agreement with three statements related to accident issues of damage. These included statements that animals in the city caused traffic jams that led to accidents, and animals could sometimes cause bodily harm to humans. Another statement was about animals sometimes hurting pedestrians, children, old and sick people. However, fewer than half the respondents agreed with the statement that animals could rub themselves on electricity poles, make them fall down and give humans an electric shock. The most frequently given basis for their beliefs was people's personal experience. Besides this, other bases included "everyone knows," and "other people say."

The following section illuminates some views related to damaging issues using respondents' quotations. Most respondents concurred with the statement that animals in the city caused traffic jams and sometimes led to accidents, especially when animals grazed outside.

One respondent remarked:

It is true that there were accidents caused by animals. Most people keeping livestock know that they are violating the existing bylaws. . . . The maximum cattle to keep is four to five and they should be zero-grazed. Most people keep more than four or five that forces them to graze their animals thus causing traffic jams and sometimes accidents (Respondent No. UAs 04, Response Nos. 228 & 229, p. 36).

In the city, animals appeared to cause more traffic jams and accidents. Some respondents thought that these problems often occurred when herdsmen moved their livestock to search for grazing areas. As one respondent put it:

Those claims are true and we still have problems with animals causing traffic jams and accidents. This is now common in areas between Ubungo and Kimara when herdsmen are taking their animals to and from the grazing areas. It can sometimes become dangerous to both motorists and pedestrians (Respondent No. UAs 15, Response No. 873, p. 140).

However, other interviewees who concurred with this statement insisted that to reduce traffic jams and accidents in the city, all animals should be zero-grazed. A typical quote from one respondent suggested:

It is true that accidents occur because animals are left to graze along the roads. The sure way to avoid this is to zero-graze all animals (Respondent No. UAs 23, Response No. 1372, p. 221).

Another responded:

I personally, as one who keeps livestock and drives a one-ton pick-up truck, agree that animals such as cattle, goats and sheep should be stall-fed or zero-grazed. They should not be allowed outside their sheds, especially now that our roads are improved; accidents can occur anytime. I agree that animals cause traffic jams and accidents in the city and that is why I insist that every person should keep only four animals (Respondent No. UAs 11, Response No. 633, p. 101).

Although most respondents expressed agreement with this statement, two appeared to disagree with it and did not believe it. One said that it was not true because people zero-grazed their animals, and the other said that she had no idea of it because she kept broiler chickens. The latter implied that even if she agreed with the view, she still felt that the damage did not concern her. As Table 23 shows, most respondents agreed with the statement that animals sometimes caused bodily harm to humans. It appeared that most respondents agreed with this statement partly because of the ubiquity of keeping large livestock such as cattle. As one respondent observed:

Yes, cattle can harm people. When we were in Arusha I saw a person that a cow had killed. I have a Jersey crossbred heifer that does not like children, and she normally chases them (Respondent No. UAs 06, Response No. 353, p. 55).

Another explained:

You see, animals can hit a person with their horns if they are not dehorned. Common cases occur when cows kick milkers. Once, a cow hit a herdsman so hard during milking that we hospitalized him for a week at the Ocean Road hospital (Respondent No. UAs 12, Response

No. 691, p. 111).

Other respondents who agreed with this view, insisted that animals are confined to reduce such mishaps. As one interviewee put it:

It is true that there are some vicious animals that can cause bodily harm to people, . . . And if the people leave these animals to wander about outside, they can hurt pedestrians, children, the elderly, and sick people. The only way to limit these mishaps is to ensure that people in the city keep their animals inside [zero-graze] (Respondent No. UAs 27, Response Nos. 1592 & 1594, p. 254).

In spite of the majority view, five respondents disagreed with the statement and said that they did not believe it because they had not seen the animals do it.

Most respondents also agreed with the statement that animals could hurt pedestrians, children, old people, and sick people. One interviewee gave a typical comment:

Yes, animals that sometimes wander about the city can hurt pedestrians, children, old and sick people (Respondent No. UAs 17, Response No. 945, p. 152).

Some respondents who had lived in places other than Dar es Salaam appeared to reflect on their past experience when concurring with statements about the damaging effects of keeping livestock. For example, one interviewee said:

Yes, animals sometimes hurt people. For instance, I had a bull that was vicious and nobody could approach it. We had to dispose of it. While in Tanga, I saw a corpse that its cause of death was a bull (Respondent No. UAs 03, Response No. 163, p. 27).

Another remarked:

It is true that animals can sometimes hurt pedestrians, children, old and sick people when they are left to wander about in the city. However, most people are now zero-grazing their animals and that has eliminated the problem (Respondent No. UAs 20, Response No. 1186, p. 193).

Views of the six interviewees who disagreed with the statement show that they did not believe it because they had not seen it happen. Others said that most cattle that people

kept were gentle and could not hurt people, for example, one respondent observed:

I do not agree with those claims because most of our animals are gentle. I have seen incidents where herdsmen hit the cattle without them retaliating. If they were vicious animals as some people claim, they would have not tolerated that kind of abuse. If it happens that the animals we keep hurt a pedestrian, child or a sick person, which can just be construed as an accident like a car hitting a person. These animals are too gentle to cause on purpose any of those accidents (Respondent No. UAs 18, Response No. 1063, p. 172).

Regarding the fourth statement in the accident category, fewer than half the interviewees agreed that animals rub themselves on electricity poles. These poles would then fall down and give humans an electric shock. As one interviewee simply remarked:

Those claims are true . . . I have seen that happen because some people used to graze their animals in the cemetery area where they rubbed on poles (Respondent No. UAs 24, Response Nos. 1438 & 1439, p. 230).

Another commented:

I agree that it is a problem especially when animals are let out to graze . . . This could in future become a serious problem (Respondent No. UAs 29, Response No. 1718 & 1719, p. 272).

However, most respondents disagreed with the view and disbelieved it saying that it was not a problem in their areas because the cattle were stall-fed, and if grazed, a herdsman always watched them. Others said that they had not seen it happen in their areas, as one interviewee explained:

I do not agree with that claim because most facilities are out of reach of our cattle. I also do not see the possibility of an animal knocking down an electricity pole just from a mere "rub." (Respondent No. UAs 23, Response No. 1375, p. 221).

City-landscape issues. Examining data presented in Table 24 reveals that most respondents agreed with all four statements related to city-landscape issues of environmental damage. Interviewees agreed particularly with the two statements: animals destroy city hedges, streams, ornamental trees, flowers, and parks, and the presence of animals in the

city had destroyed its beauty.

Table 24

Number of Urban Agriculturalists (N = 29) Concurring With Statements Related to City-Landscape Damage and The Basis for Their Beliefs

Focus of question	Number of respondents concurring	Basis for belief mentioned in the responses (No. of respondents who said so)
Animals destroy city hedges, streams, ornamental trees, flowers, and parks.	28	Personal experience (28) "Everyone knows" (14)
The presence of animals in the city has destroyed its beauty.	26	Personal experience (26) "Everyone knows" (8)
Animals cause damage to government houses, water pipes, telephone installations, and roads.	24	Personal experience (24) "Everyone knows" (14)
The poorly designed and built shed <u>mabanda</u> that house animals cause the city to look ugly.	24	Personal experience (24) "Everyone knows" (11)

More respondents expressed agreement with statements related to these city-landscape issues than was the case for the other four kinds of issues. The most frequently given basis for their beliefs was personal experience. On the view that livestock destroyed city hedges, streams, ornamental trees, flowers, and parks, for example, one interviewee said:

Nobody living in Dar es Salaam would deny that animals are destroying ornamental trees, flowers, and parks. For example, you must have seen that most of the beautiful areas have been destroyed by the grazing animals (Respondent No. UAs 28, Response No. 1659, p. 264).

Another remarked that:

It is true that animals have destroyed the city hedges, flowers, ornamental trees, and parks. The sole destroyers are humans who bought the animals and cannot care for them well in the urban environment. We should not blame the animals but instead the people, some of whom are adamant about not zero-grazing their animals (Respondent No. UAs 18, Response No. 1068, p. 173).

Yet, another responded:

Yes, it is correct that animals destroy the city hedges, streams, ornamental trees, flowers and parks. I fail to understand why some people can disagree with those claims when it is so obvious that animals that people brought to the city have destroyed the city's aesthetic. . . . (Respondent No. UAs 02, Response No. 125, p. 20).

However, one interviewee disagreed with the statement and said that it did not apply to her because she kept broiler chickens.

Most respondents also concurred with the view that animals had destroyed the beauty of the city, for example, one interviewee gave the typical comment:

The presence of livestock has destroyed the city's beauty. The Dar es Salaam of 1960s is not the one we see today. Of course, apart from livestock, there are other factors contributing to the damage of the city environment (Respondent no. UAs 04, Response No. 244 & 245, p. 38).

Another put it:

Animals have partly degraded this city, there is no question about that. Livestock have and will continue to degrade this city if efforts to reduce animals do not succeed. I think there should be bylaws that force all people keeping animals to take their animals out, and the City Council should strictly enforce these bylaws (Respondent No. UAs 14, Response No. 823, p. 133).

And another summarized:

I agree that the animals we keep have destroyed the beauty of the city. I would prefer that the city return to the 1960s when it was a beautiful one. Now the question becomes: What to do with all these animals people paid so much money to buy? I think the government should research suitable places where urbanites can take their animals. In the 1960s, the "heaven" of Dar es Salaam was the Oysterbay area, however, it is now full of animals that have destroyed its flora (Respondent No. UAs 29, Response No. 1733, p. 274).

In spite of the majority agreement with this view, three respondents disagreed with it. They maintained that it was not keeping livestock that had destroyed the beauty of the city, but other causes. To this, one respondent explained:

The presence of animals has not destroyed the beauty of this city, but the City Council has. The various city bylaws do not function anymore. For example, garbage, dust, and the general filthiness of the city are situations not caused by the presence of animals (Respondent No. UAs 09, Response No. 530, p. 84).

Most interviewees expressed agreement with the view that animals damaged the

government houses and the city infrastructure. This appeared to be due to the pervasiveness of keeping livestock in the city, for example, one respondent commented:

The serious ones are the damage to the government houses, especially where animals such as cattle and chickens are housed in parts of the existing quarters. Here too, there is a degradation of the house compounds due to livestock keeping. I said earlier about goats eating the live fences and hedges in most parts of the low density areas. Most people are aware of these problems and that is why I say that we are facing a crisis that is of our own making (Respondent No. UAs 01, Response No. 70, p. 11).

In the same vein, another explained:

I agree with this claim because right now people are keeping animals everywhere in Dar es Salaam. The astonishing thing is that it has become fashionable to keep dairy cattle in the city. . . . All these activities, however, damage the government buildings in which animals are kept. Animals too, have damaged houses and their compounds in the Oysterbay, Msasani, and Mikocheni areas, to name a few. That is also true of water pipes, telephone installations, and roads in those areas (Respondent No. UAs 19, Response No. 1117, p. 181).

There was a common trend among interviewees who agreed with this statement to shift the blames of damage to other agriculturalists in other areas. This was so even though some interviewees also kept livestock that contributed to the environmental damage. A typical comment of one respondent is in place:

I agree with that claim because most people keeping livestock in the government houses have damaged them, especially in places such as Oysterbay, Masaki, and Msasani. I should say that most of the former tenants in those houses, who were mainly whites, took the health issue seriously. The current tenant does not. Most of the African tenants seem to consider the income they can get from the animals they keep in those houses before anything else. That is why animals have damaged most of the buildings (Respondent No. UAs 27, Response No. 1597, p. 255).

The responses of the five respondents who disagreed with the statement revealed two aspects. First, those who disagreed with the view and said that it was only true for other people because they kept livestock such as chickens. Second, those who disagreed with the statement saying that it was not the animal that damaged the infrastructure but the people who kept them. For example, one interviewee explained:

I personally think that the animals are not the ones that are damaging the urban environment, but the people who keep them. Cattle need to have proper places where they can drink water and also where they can eat the feed and concentrates. If owners do not provide these places, how can we blame the animals for the damage caused in those houses? I squarely lay the blame for the damage in those houses on livestock keepers instead of on animals (Respondent No. UAs 18, Response No. 1065, p. 173).

Most respondents agreed that the livestock's poorly designed and built sheds made the city to look ugly. As one interviewee put it:

Yes, I agree that the livestock sheds have made the city look ugly . . . First, we cannot build the permanent animal sheds because the houses we stay in are temporary residences for most of us. So, why build a good costly shed on a government house plot just to be told that I will be transferred? To most people it can be a loss to build a permanent shed on a government house plot. . . . However, those living in their own houses have built good permanent sheds following plans supplied by the district veterinary offices. Mr X living in the Segerea area, in the peri-urban, for example, has built some good cattle sheds to city plans simply because that is his permanent place (Respondent No. UAs 06, Response No. 368 & 369, p. 57-58).

Another remarked:

I agree with that claim that the sheds built to house animals have made the city look ugly. The thing about these sheds is that they were built using any type of material that a person could get hold of (Respondent No. UAs 19, Response No. 1125, p. 182).

Still another commented:

There is no doubt in my mind that the sheds built contribute to damaging the beauty of this city. Some sheds are near the city centre making it look ugly (Respondent No. UAs 27, Response No. 1606, p. 256).

Regardless of the majority view, three interviewees differed with the statement and disbelieved it saying that they did not see how the animal sheds built behind people's main houses affected the beauty of the city. As one respondent stated:

I do not see how the animal sheds cause the city to look ugly when most are built behind the livestock keepers' main houses. And the beauty of any house is on its front view . . . (Respondent No. UAs 09, Response No. 533, p. 84).

Yet, another interviewee disagreed with the statement and said that some animal sheds in the city were far better off than some people's houses in the squatter low quality housing

areas.

### Summary and Commentary

Most respondents expressed agreement with most of the statements related to city-landscape and accident issues. More than half the interviewees agreed with most statements about psycho-social and socio-political-legal issues. However, less than half the interviewees agreed with most of the statements related to disease-health issues. The respondents' main basis for their beliefs to most issues was personal experience, and other bases included "everyone knows," complaints from neighbours, and "other people say."

Most respondents did not consider that the livestock statements about damaging applied to them, but only to others. For example, people in the low quality housing areas blamed those in the high quality housing areas for damaging the environment, and vice versa. This was sometimes true even between agriculturalists in the same housing location. For example, one interviewee in the Oysterbay area who kept chickens and knew that he was damaging the servant's quarters and polluting the environment, still blamed others who kept cattle. He said:

Of course they know that they are damaging the hedges, lawns, beaches, and fences. For example, when I moved here the beaches were beautiful and flourished with grass but now animals have over grazed on them. The common practice now is for the people to go to these areas and gather grass for feeding their animals. Animals are turning our city into an arid environment. . . . (Respondent No. 04, Response No. 230, p. 36).

Another explained:

I agree that animals cause damage to most government houses where the people have built sheds to house cattle and chickens thus destroying the beauty of those houses. For example, the inside of my friend's house who is married to a government minister is clean. But behind

it one sees that there are animal sheds everywhere . . . The ideal compound for a minister's place should be clean with beautiful flowers, gardens, lawns, and children's playgrounds. However, in most houses of our government ministers these are mere dreams (Respondent No. UAs 29, Response No. 1727 & 1728, p. 274).

The above two quotations are typical of how most urban agriculturalists continued their damaging practices by ridding themselves of wrong doing. The fault lay with "those others" who were aware of the damaging effects of urban agriculture, but disregarded them and continued the damaging practices.

The data also showed the inaccuracy of personal experience and "everyone knows" as the bases for beliefs about the issues of environmental damage. The inaccuracy of the information initially obtained might have become further distorted during transmission from one person to another. For example, one interviewee explained what she had heard:

I have heard that there are some women feeding contraceptives to broiler chickens. But I do not know how a woman can get enough contraceptives from the UMATI clinic to feed, say, 1,000 broiler chickens, unless she buys them from elsewhere. It is true that there are some women feeding contraceptives to chickens, but I do not know whether they put them in the water or in the feed. . . . This reminds me of a person who told me to mix lard with broiler mash and feed it to broiler chickens that would grow fast and be sold at six weeks instead of normal eight. . . . (Respondent No. UAs 20, Response No. 1176, p. 191).

Most agriculturalists seemed to depend on information from neighbours who might also have received inaccurate information. This issue was partially aggravated because the people did not receive adequate information from agriculture/livestock extension agents.

As one respondent observed:

I do not get any agricultural extension advice. I go to the office to see the veterinary extension agent when my animals are sick. Nobody comes here to advise me on what I should do with the animals. Most people rely on their neighbours who have been in the business for some time for information about their enterprises. These neighbours have become "subject matter specialists" through their experience. Neighbours also got the information by seeing and talking to other neighbours or friends. . . . (Respondent No. UAs 18, Response No. 1077, p. 175).

Several conclusions can be made from the views of these agriculturalists. First, more than half the respondents agreed with most of the statements in all issues-categories except disease health. Second, only one of the disease health statements yielded agreement from a majority of respondents. Third, even when damage was acknowledged it was attributed more to others' practices than to respondent's own. Fourth, most urban agriculturalists relied on personal experience as the basis of their beliefs about the damaging effects of urban agriculture. This suggested that government ministries, departments, and other institutions either did not offer environmental education to urbanites doing urban agriculture or were ineffective in doing so. Fifth, respondents mentioned very little of their personal experience as a basis for their beliefs about the damaging issues related to disease-health. This supported the views of some public officials that most urban agriculturalists were not knowledgeable of the scientific aspects of the damaging effects of urban agriculture and its impact on public health. Again this largely points to the government's inability to provide people with public health education. Sixth, many of the beliefs expressed were erroneous and appeared to rely on word of mouth information from neighbours, friends and others. Again, this seems to be evidence of lack of education or inadequate information dissemination.

#### The Views of the Public Officials

Of the 27 public officials, 24 (ten agricultural extension agents and 14 city officials) agreed that most people doing urban agriculture knew about the damaging effects their activities had on the environment. As one official put it:

May I say that these issues concerning environmental damage are not new. They are not new because even a child knows what an environment is. When I talk about the environment I mean either keeping it clean or making it dirty. Everybody knows about this, but the problem only comes up when certain activities done by individuals for their own benefit damage the common environment. . . . So, most people know about environmental damage but there is a lack of bylaws enforcement. Everybody likes a clean environment but there must be an elaborate organization for enforcing the bylaws (Respondent No. PO 18, Response No. 275, p. 66).

Another commented:

I have earlier said that these people know that their actions are causing environmental degradation. These people are mostly directors, commissioners, and principal secretaries. Most of their residences are along the beaches where most of their cattle are found grazing. They even see that the beach is degrading and that some people care about it. They are even aware that the National Environmental Management Council (NEMC) is looking at the environmental degradation issues in the city. These peoples' motives are to keep more cattle and get money from the milk sales (Respondent No. PO 01, Response No. 06, p. 4).

Still another said:

Let me first consider those keeping livestock. Most of these people have high incomes and positions in the government and other public institutions. The question of being aware is debatable but for sure they are aware of the environmental degradation caused by their animals. My hunch is that they might be aware but decide to ignore the consequences because of the prevailing circumstances. I think we still need to raise their awareness more than we have been doing. I suspect that our people might have vague ideas about the environment and not realize their full contribution to damaging the urban environment through their urban agriculture activities. For example, we have people growing vegetables using polluted water from the industries (Respondent No. PO 03, Response No. 52, p. 13).

Some public officials said that most agriculturalists knew about the damaging effects of their enterprises because they had a high level of education, and occasionally received complaints from their neighbours. As one official stated:

Most people keeping livestock know that they are damaging the urban environment. These people are among the well-off and are educated. . . . For example, some urban residents have come here complaining about the noise and odour produced by their neighbours' pigs. Most people come here hoping to find solutions after failing to resolve their differences with their neighbours. It is a bother to most people but there are some individuals keeping pigs who ensure that all the pig dung is ferried away to their peri-urban farms (Respondent No. PO 27, Response No. 441, p. 97).

Another remarked:

Most people are aware of the damage their livestock cause to the environment because they

are not ignorant. These people are highly educated, and are economically well-off. Some even belong to government ministries connected with the preservation of the environment. Most people are keeping cattle and chickens for economic motives. That is the major environmental management problem, that is, can we really manage the environment and forego the economic considerations? (Respondent No. PO 02, Response No. 39, p. 10).

**Still another explained:**

Yes, most people keeping livestock know about the damage they cause because they are highly educated people (Respondent No. PO 12, Response No. 206, p. 47).

Some officials said that although most agriculturalists knew about the damaging effects of their enterprises, they could not stop them because they earned money. One official gave the typical comment:

Most people who keep livestock in the city know that they are causing environmental damage. During the rainy season, the smell from animal dung can be offensive because most people pile it outside waiting for buyers, as it is an economic commodity. Chicken manure in a plastic bag that held sulphate of ammonia fertilizer sells for T Shs 500 [US\$ 1] whereas that of cattle sells a bit lower. Most people keeping livestock know about the smell and other nuisances caused by their animals (Respondent No. PO 19, Response No. 291, p. 69).

**Another explained:**

Yes, most are aware of that, but most of the chicken manure is bought by people growing amaranths (Respondent No. PO 24, Response No. 390, p. 88).

**Still another pointed out:**

I can say that most people know the damage they cause to the urban environment by keeping livestock but they do it because of the economic pressure. Most people weigh the costs and benefits of keeping livestock and find that it pays to keep animals and so they do it. Most people are saying that milk sales exceed the monthly income they get from salaries. People know that they are damaging the environment but what can they do? (Respondent No. PO 06, Response No. 104, p. 24).

In an effort to reduce environmental degradation, NEMC advises government ministries, departments and other institutions on environmental matters, and teaches the public about the proper ways of managing the environment. In the city, such efforts included holding seminars with agriculturalists so that they can lessen the environmental degradation due to

urban agriculture. However, these educational endeavours were not successful as one official explained:

NEMC has been providing advice to the government and the City Council to have the people reduce the number of animals they keep in the city or stop keeping them. NEMC has all along been against cattle grazing along the beach, which we presume has contributed to beach erosion. We have held several seminars but the problem is that even those who are supposed to know about the beach erosion are also keeping livestock in the city. Some of these people are senior government officials such as those with the Ministry of Agriculture, Livestock and Cooperative Development (MALCD) (Respondent No. PO 01, Response No. 5, p. 4).

In its attempts to get its message across to officials, NEMC often offered environmental education to women of officials doing urban agriculture. The aim was for the women to teach their spouses about the damaging effects of urban agriculture and convince them to reduce livestock numbers in the city. One official pointed out:

I remember that we held a seminar with urban women who kept cattle and chickens in the city about the environmental damage these animals cause. The aim was to sensitize women to environmental problems so that they could realize their role in reducing the exacerbation of environmental degradation. The ultimate purpose, however, was for the women to convince their spouses to reduce the number of cattle and chickens kept in the city (Respondent No. PO 01, Response No. 8, p. 4).

However, conducting educational seminars for agriculturalists in the city has its own problems. As evidence suggested, these problems mainly stemmed from lack of funds. It seemed also to be the case that most urban agriculturalists could not attend seminars because they were employees in several establishments that ended work the same time as the seminar organizers did. As one official commented:

We are supposed to conduct seminars for urban agriculturalists and the ministry is supposed to give us money for running them. However, we receive very little money from the ministry. . . . To organize seminars in the city is difficult because the people supposed to attend, the livestock keepers, are also working during the day in various offices and other places. The problem is that seminars occur during the working hours making it difficult for livestock owners to attend. Most owners, therefore, decide to send their herdsmen to attend to the seminars. . . This has led to the herdsmen not communicating to their owners most information they received from the seminars--it ends in the thin air (Respondent No. PO 23, Response No. 362, p. 82).

In addressing the premise that some people probably did not know about the environmental effects of urban agriculture, one has also to examine the functions of MALCD. The ministry relies on agricultural extension agents to go out and teach agriculturalists on matters about agricultural production, and not about lessening the environmental degradation that urban agriculture appeared to engender. Evidence suggested that most agents could not give advice on the latter because they did not have training in environmental education. Also, programs that MALCD aired at the national radio station about agriculture were directed toward rural farmers even when evidence suggested that few benefited because of the timing and the few radios available. But even if urban farmers listened to the radio programs, they did not carry information about lessening environmental damage, for example, one official remarked:

Another problem is that most of the radio programs that MALCD produces focus their attention on rural farmers instead of urban farmers. For example, most farmers in the city may listen to information about keeping sheep, cattle, or growing maize that is inconsistent with what they are doing here (Respondent No. PO 22, Response No. 315, p. 73).

The idea that some people were not aware of the environmental effects of urban agriculture can also be inferred from some agriculturalists' lack of know-how. As one official explained:

For example, some educated urban farmers have brought hybrid maize seeds from the region of Mbeya and planted them in their fields in Dar es Salaam. Most have experienced failures because hybrid maize is not suitable for the region of Dar es Salaam. Most farmers go to see extension workers when they have suffered failures. . . . People think that they know about agriculture and can do it without seeking technical advice from extension workers (Respondent No. PO 20, Response No. 319, p. 74).

Observations made in the field for this study seemed to agree with the responses that some officials gave about agriculturalists' lack of awareness about the environmental damage their activities caused. For example, one official explained:

In Dar es Salaam, for example, there may be about 800 households keeping dairy cattle. If we were to assess how they started, we would find that few had consulted the district veterinary offices. Let us say we were to assess the housing of dairy cattle, a critical aspect in urban setting. Of the 800 households, there are hardly 100 households with cattle sheds. The rest have built simple structures for housing animals. If we were to place dairy cattle keepers in three categories, where category one is the best and category three the worst, most keepers would be in the third one. Most people do not go through the primary step, that is, going to the veterinary office or extension worker to ask for information about keeping livestock. In my office, for example, we have brochures with information regarding types and sources of dairy cattle and their possible problems if they are brought to Dar es Salaam. According to our experience, we know that dairy cattle from the region of Mbeya significantly differ from those from the regions of Bukoba, Kilimanjaro, and Mwanza. However, these differences are not apparent to most people keeping dairy cattle in the city. . . . (Respondent No. PO 22, Response No. 320, p. 75).

Of the 27 officials, three said that most urban agriculturalists knew superficially the damaging aspects of urban agriculture, but lacked a scientific understanding about the damaging effects that agriculture caused on the environment and its broader impact on public health. As one official put it:

I think they are aware of the damage they cause to the environment but they may not know the details. For example, if one told some livestock keepers without public health knowledge that to let cattle graze indiscriminately, they are increasing the number of breeding sites for mosquitoes, they would object because they do not know about this. Similarly, if one told them that pigs kept in the compounds can infect them if they improperly dispose of the dung, they might not realize this (Respondent No. PO 14, Response No. 230, p. 52).

Another commented:

Most people keeping dairy cattle are aware of the environmental damage but they have no solution for it. Most people do not know the health implications of their livestock activities and they do not clearly see that these very activities can cause disease for their families and damage the urban community. For example, the City Council has bylaws that prohibit livestock from grazing around the city but there are animals doing just that. Grazing itself causes contamination to the urban environment. I think urban agriculture can be done in the peri-urban areas such as Goba, Kibamba, Mbezi, and Ununio, and so on. But not in the city, as most people are now doing it (Respondent No. PO 13, Response No. 222, p. 50).

Such responses raised the question of what were some scientific things that most urban agriculturalists would not be aware of? To answer this, one official explained:

People keep most of the livestock in the government houses. . . . They are responding to the economic realities but keeping livestock causes many problems. For example, animal dung

causes an increase of nitrates in the ground water, and if consumed by young children, it can cause cirrosis (blue babies disease) or *methaemoglobinaemia*. Second, animal dung in the city can cause a tetanus epidemic. Tetanus is normally found in cattle dung and since there are people working in the city, for example, construction workers, they may be cut by nails or sharp objects. Eggs can cause food poisoning, especially *salmonella*, because of the dung residue on the outside of the chicken egg. Another problem with keeping livestock is that most of the dirty water when mixed with animal dung forms pools in which the *Culex* mosquitoes can breed. Sometimes the animal dung dumped along the roadside mixes with rain water, and it also forms pools of waste water because of our poor city drainage system. *Culex* mosquitoes prefer to lay their eggs in pools of dirty water and by the year 2010, most of the people in Dar es Salaam will be infected with filariasis - *busha* or inflammation of the scrotum. This will come about like influenza. That is, although most people are not infected today, we will see symptoms of an increase of filariasis in the future. *Culex* mosquitoes also cause a disease called urban bancroftian filariasis - *matende*. Since most of Dar es Salaam is filthy and the drainage system has broken down, there are pools of water that has increased the population of *Culex* mosquitoes. Another thing is that most people in the squatter areas are using pit latrines that are sometimes shallow. These are preferred breeding sites for *Culex* mosquitoes (Respondent No. PO 15, Response No. 247, p. 56-57).

In summary, most public officials agreed that most agriculturalists had knowledge about the damaging effects of their practices. However, some said that most agriculturalists did not have a deeper understanding of the damaging effects of their practices and the impact on public health. Although MALCD and NEMC offered education programs to urban agriculturalists, it appeared that they were not matched to urban agriculturalists' needs in several aspects. This was so with most of the radio programs that MALCD aired through the national radio. Some MALCD officials said that most agriculturalists did not visit the three district agricultural offices to seek information about agriculture/livestock production. They also said that most urban agriculturalists did poor urban agriculture that damaged the environment, a sign that farmers lacked the knowledge. Yet, the regional agriculture extension officer claimed that field agriculture/livestock extension agents were posted in every *mtaa* (a block with houses consisting of several streets) in the city. The problem might have been that the corps of agricultural extension agents were not competent enough to deal

with some educated urban farmers. And this could have led to some agriculturalists perceiving the information that agents gave as inferior and irrelevant. As one official explained:

We should agree that most of our extension workers are not prepared to work for the kind of agriculture they face in the city . . . . Some extension agents have low education attainment compared to some of the livestock keepers they serve, some of whom include the highly educated people in the city. I have received complaints from livestock keepers who question the type of extension worker I have sent them. Some people have claimed that our livestock extension workers cannot offer simple information about dairy cattle, and if they did, the information was shallow and inadequate . . . . Certificate and diploma holders impersonate veterinary doctors and mess with people's cattle, and owners have come complaining about this to the veterinary offices. Most livestock keepers ask us why did we employ these people in the first place, and why dispatch them to attend to their livestock. This is a serious thing (Respondent No. PO 22, Response No. 320, p. 75).

Four points can be made from views expressed by officials about urban agriculturalists and their practices. First, they considered that most agriculturalists had a superficial understanding of the damaging effects of their practices. Second, the government had few educational programs to lessen the environmental damage that urban agriculture engendered. Third, urban agriculture/livestock extension agents did not teach farmers about lessening the environmental damage that their practices caused. Fourth, educational programs conceived for rural farming did not seem to work for urban agriculture.

#### REASONS PEOPLE GIVE FOR THE PERSISTENCE OF URBAN AGRICULTURE IN SPITE OF ITS DAMAGING EFFECTS

Readers will recall that the researcher used an interview schedule in which the second set of questions was designed to find the reasons people gave for continuing to do urban

agriculture even though they knew it damaged the environment. The "reasons for continuation" questions were only asked if the interviewee had said that he or she had information about the issue that was asked about in the first part of the question. This section has three main subsections. The first subsection explains the two most common motivations that urban agriculturalists and public officials gave for people continuing to do urban agriculture. Subsection two examines the two reasons that encouraged people not to stop doing urban agriculture. The last subsection briefly examines the respondents' views on solutions to the problem.

#### Motivations to Continue Urban agriculture

This subsection has two parts to it. The first part examines the economic motivations which agriculturalists and public officials said compelled people to continue doing urban agriculture. The second part explains the nutritional and other types of motivations which were identified.

Economic motivations. All urban agriculturalists who agreed with the statements about the issues of environmental damage because of keeping livestock said that most people did it for economic reasons. The accuracy of the view is confirmed by data already examined: data in Table 7 in Chapter 3 describing the Tanzania national informal sector of 1991 have underscored the importance of urban agriculture for economic motivations. Also, field data for this study show that respondents sold 89 percent of their daily production of milk and eggs. Data presented in Tables 16, 17, 18, and 19 in this Chapter also reveal the economic

aspects of doing urban agriculture.

Table 25

Number of Urban agriculturalists (N = 29) Reporting Their Motivations to Continue Doing the Damaging Urban Agriculture

Type of motivation	Number of respondents reporting each type
Economic	29
Nutritional	29
Manure	9
Culture	8

Respondents were emphatic about the economic situation. As one interviewee explained:

Most people do not keep livestock for cultural reasons. The issue of keeping livestock in the city is purely for increasing income. For example, the salary income of an expatriate officer is different from that of an African local officer. Expatriates earn more and yet spend less because they convert dollars into local money. Most African officers earn low salaries and yet they have to shoulder heavy financial family obligations. Low earnings compel them to keep livestock, especially dairy cattle and chickens for earning extra income (Respondent No. UAs 02, Response No. 89, p. 14).

In Dar es Salaam, commercial urban agriculture had been in existence for almost two decades (1970s to 1990s). Most people undertook it as an informal way of alleviating the persistent national economic hardship. One respondent who had lived in the city for 30 years, described the historical emergence of urban agriculture and his motivations for doing it. He remarked:

I think, people keep animals in the urban centres because it is an economic activity. This is to say that whoever keeps animals has needs for supplementing their income. Keeping animals was not common some years back when people got salaries that were adequate to buy their basic requirements. I say this because I have lived in Dar es Salaam for 30 years and I know what I am talking about. Soon, after the Arusha Declaration in 1967, when supplementary income was restricted, some people started keeping chickens, dairy cattle, and so on to supplement their income. So, urban agriculture is an economic activity designed to supplement people's income (Respondent No. UAs 13, Response No. 710, p. 114).

The low salaries received by most government and public senior officials were said to compel them to leave their official duties at times to attend to chores related to their urban agriculture enterprises. Many people earned a higher income from these enterprises than from their salaries. One respondent said:

Anybody who keeps cattle in the city earns from 80 to 90 percent of their total monthly household expenses. A person may work for eight hours in a formal job (e.g., government office) but the money earned only pays for 20 percent of total household expenses. So, you can see that 80 percent of the income comes from the one or two hours a person spends on an informal enterprise(s) after eight office hours. There is every reason for most officers and workers to squeeze some time out of their office hours for doing their private work where they get more income. I think this is okay and do not expect that most livestock keepers only use their after work hours, that is, after 3.30 p.m. or 4.00 p.m. There are times when they use government, public corporation, and institutions' time to look after their informal enterprises' chores (Respondent No. UAs 11, Response No. 610, p. 98).

Respondents' views suggested that economic hardship had affected people of all socioeconomic groups, and forced most to engage in agriculture. One respondent observed:

The reasons that made me start keeping broiler chickens was the economic hardship I faced. I wanted to get some extra income to offset the cost of living in this city . . . Most people keep livestock in the city because of the economic hardship that they face (Respondent No. UAs 26, Response Nos. 1498 & 1499, p. 240).

Another commented:

Most people keep animals in the city because they get money and food. Nobody does it as a hobby. If people's salaries were high enough that they could afford to buy milk and eggs for their families, most people would not keep livestock. For example, our salaries are not high enough to buy most of the things we want. As it is now, one litre of milk costs T Shs 200 [US\$ 0.42], and I would be paying T Shs 6,000 [US\$ 12.5] per month if I did not keep cows. What we are doing is trying to find ways to subsidize our income (Respondent No. UAs 20, Response No. 1134, p. 184).

Other respondents said that economic hardship was mainly an external entity affecting individuals and their families. These respondents viewed urban agriculture as an internal antidote for fighting an externally inflicted problem. One respondent put it:

There are people keeping livestock who take official time for errands connected to their livestock activities. From earnings received from these activities, most people can comfortably

live in this city. First, there is inflation that affects everybody in this country. People are forced to look for ways to subsidize their income. I will give you my own example here. I have three children in private schools. Each requires about T Shs 80,000 [US\$ 167] for school fees and other expenses. How can I raise that money from my salary? You should also not forget that there are people who need our help from my wife's side and mine as well. Then I meet food requirements for this house. These are realities and people tackle them in one way or another. Keeping livestock seems necessary to most, to make ends meet (Respondent No. UAs 05, Response No. 271, p. 42).

All ten agriculture/livestock extension personnel respondents also said that people did urban agriculture for their economic survival. One official substantiated this point:

People with information about the damaging aspects of urban agriculture continue to do it because of economic hardship. . . . I get roughly between 20 and 30 litres of milk per day . . . . If we take the lowest figure, which is 20 litres, so, 20 litres multiplied by seven days is equal to 140 litres per week. Then, 140 litres multiplied by T Shs 200 (US\$ 0.42) the price of one litre equal to an income of T Shs 28,000 (US\$ 58) per day. Now, remember that I spend T Shs 10,000 (US\$ 21) for forage, and there are the costs of the herdsman, medications, and treatment (Respondent No. PO 18, Response No. 274 & 278 pp. 65 & 67).

Government officials' views support those of the people doing agriculture. Often, some officials interviewed admitted that they also did urban agriculture for economic reasons.

One official remarked:

It is not true that most people are keeping cattle because they like them, but it is for the money they get from the sale of milk. In Dar es Salaam, keeping dairy cattle is a lucrative business. For example, based on five litres of milk per day per cow, a person can earn T Shs 6,000 [US\$ 13] per month. This is attained after taking out one litre for feeding the calf, one litre for buying forage, one litre for home consumption, and one litre for paying the herdsman. One remained with one litre sold for T Shs 200 [US\$ 0.42]. Multiplying T Shs 200 [US\$ 0.42] with 30 days, one is assured of non taxable profit of T Shs 6,000 [US\$ 13] per month. These calculations are of a cow with the lowest milk yield. There are people who get more than ten litres per day and keep crossbred cows that have longer lactation periods. There are people making money out of keeping dairy cattle in the city. Everybody here, including myself, keeps dairy cattle and makes some good money from it. So, we are talking from experience and from the professional point of view (Respondent No. PO 22, Response No. 353, p. 81).

The remaining public officials also had similar views about doing urban agriculture, and most said that people did it for economic survival. Most public officials agreed that livestock keeping was on the increase because most people earned high profits that supplemented the income earned from their formal jobs. They perceived that this was

important in an economy facing high inflation rates that erode people's income. Although sometimes the researcher varied the questions asked of the city officials to prompt for different answers, it didn't seem to make a difference. For example, one city official was asked who he blamed for the existence and continuation of urban agriculture. His answer still revolved around economic motivations:

I do not blame anybody for doing urban agriculture but the poor economic situation that has forced most people to keep livestock and grow crops in the city. We have reached a stage where our salaries no longer support our lifestyles. For example, most people who are government employees receive salaries that do not support them, so they look for other ways to bridge the gap. They start keeping chickens or dairy cows to make sure that their families are well fed . . . Most people do various activities in the city to increase their income. I do not think that there is a person to accuse, instead the economic hardship is to blame (Respondent No. PO 04, Response No. 67, p. 16).

Nutritional and other motivations. The twenty-nine urban agriculturalists also said that other minor reasons that motivated people to do urban agriculture included nutritional, production of manure, and cultural. All respondents said that people partly did urban agriculture for nutritional needs, but most viewed it as a side-effect to the economic survival reason. Most respondents shared the common thinking of Tanzanians that people with enough money can also buy enough food for their households. Respondents said that the money they got from agricultural enterprises was used partly to buy food for their families. It is because of this that respondents viewed the two reasons as supporting each other. For example, one respondent observed:

People keep livestock and grow vegetables in the city so that they can increase their income. This is so with those working in offices because after work they look after their animals or vegetables to subsidize their income. From these activities they also get food such as eggs, milk, and vegetables (Respondent No. UAs 24, Response No. 1406, p. 225).

Another said:

People practice urban agriculture in the city because of the standard of living that has gone up.

Salaries can no longer meet the prevailing cost of living. Urban agriculture provides an additional income and food for most people (Respondent No. UAs 08, Response No. 429, p. 67).

Occasionally, some interviewees wondered why the researcher asked about the reasons for keeping livestock in the city, which seemed to be obvious to everyone: for money and food.

As one respondent explained:

First, we get money and you have seen both people of African and Asian origins coming to buy milk here. The second thing is that we drink the milk. Look how healthy my children are and I think your question is answered--to get money and food (Respondent No. UAs 08, Response No. 434, p. 68).

The ten agriculture/livestock extension personnel interviewed also said that most people did urban agriculture for reasons relating to nutrition. For example, one official remarked that:

Personally, I think that most people keep livestock in the city because of the economic hardship they are facing. For example, some years back salaries were enough. But these days they are insufficient, compelling most people to start keeping livestock to supplement their income. Of course, people consume some products in the households (Respondent No. PO 27, Response No. 436, p. 96).

However, of the other seventeen officials interviewed, only three mentioned that getting food was a reason for doing agriculture. Most saw food as second to money, as described by one official:

Personally, I think most people do urban agriculture in the city because they want to get money and food. Most people who keep laying hens and broiler chickens, for example, do not do it for food but for money instead. Most people of African origin prefer local chickens for food because people claim they are more palatable than the exotic crosses. Another thing is that in the early days we did not have the habit of keeping dairy cattle in the city. Most of what we now see started because most people wanted to sell the milk and get money. So, people keep animals in the city to get money (Respondent No. PO 05, Response No. 88, p. 20).

Some people also perceived that urban agriculture provided food to their fellow urbanites and it should therefore be improved instead of banned. These sentiments appealed to most

people after some State-run institutions that used to sell constituted milk to urbanites started to collapse. In the city, for example, the Ubungo Milk Plant was facing unprecedented fiscal problems and it appeared that livestock keepers had seized the opportunity to increase their head of cattle. Underscoring the nutritional motivation, one city official said:

The merits of keeping livestock in the city outweigh the disadvantages. For example, if we tell people not to keep cattle in the city, where are they going to get the milk? Most households have milk bills from their neighbours for feeding their children (Respondent No. PO 10, Response No. 166, p. 40).

One subsidiary motivation mentioned for doing urban agriculture was the production of manure, and culture. In the city, evidence suggested that four distinguishable uses of animal manure acted as motivations. These were: (1) commercial growers using chicken manure in amaranths (*mchicha*), (2) livestock keepers using small amounts of it to fertilize their small compound plots of crops, (3) livestock keepers giving it free to neighbours, and (4) selling the manure to other people with farms in the peri-urban areas. As one interviewee summarized:

Keeping livestock has many advantages, for example, cattle manure is useful in growing plantains, maize, and vegetables. Chicken manure is mostly used for growing African spinach--amaranths (*mchicha*), a flourishing enterprise in the city. The use of this manure has undoubtedly increased the crop productivity in Dar es Salaam. The positive advantages of animal manure are many more than the few disadvantages that people complain about (Respondent No. UAs 08, Response No. 451, p. 71).

Some city officials interviewed also kept livestock, and from what they said, their earnings were from animal manure, and so it can be construed that it was a partial motivation for them. One official explained:

I sell one ton of cattle manure for T Shs 7,000 (US\$ 15) and help to provide organic manure to some people who farm in the peri-urban areas. Also, people with farms in the Kisarawe, Kibaha, and Mwanambaya areas have bought some manure from this pit. The other day I gave

free to Mr. X ten tons of manure to use in his 100-hectare farm in the Mwanambaya area (Respondent No. PO 17, Response No. 259, p. 61).

Few of the urban agriculturalists and city officials that were interviewed implied in their responses that culture was a motivation for doing the damaging urban agriculture. For example, one interviewee said:

It may or may not be so. For example, I come from the district of Mbulu and we keep animals there. But in Dar es Salaam there are people of Arabic, Asiatic, and African origins who appear to keep cattle more because of an economic venture than a cultural one (Respondent No. 08, Response No. 430, p. 67).

Another, however, explained that for him culture was a factor

Yes, that is also true. People keep animals because they grew up in areas where they kept animals . . . You just cannot live without animals around. Everybody here is used to seeing animals around and the little we get satisfies us (Respondent No. UAs 06, Response No. 323, p. 51).

### Encouragement For Not Stopping Doing Urban Agriculture

This subsection discusses the factors which both agriculturalists and public officials gave that encouraged people to continue doing urban agriculture. First, the laxity of bylaws enforcement is discussed, and second, issues related to the government's encouraging urban agriculture are reviewed.

Lax bylaws enforcement. Of the 29 agricultural interviewees, 22 responded to the "reason for continuation" question: "Why doesn't the City Council enforce the bylaws?" Most interviewees said that most people continued to do urban agriculture partly because the city council did not enforce its bylaws. Most respondents also expressed their views that although there were bylaws to regulate urban agriculture, most people violated them grossly, especially senior government officials. One interviewee said:

It is difficult to enforce bylaws because most of those keeping cattle are senior government and ruling party officials. You know what could happen to the militia if they enforced the by-laws by the book. They could lose their jobs (Respondent No. UAs 03, Response Nos. 154 & 155, p. 24).

Another respondent gave a remark that was typical and attributed the failure to the lack of staff and the pervasiveness of urban agriculture:

The City Council does not have enough workers to enforce the bylaws because urban agriculture is done everywhere. Not only that, but senior government officials do the most agriculture and are not amenable to the bylaw enforcement (Respondent No. UAs 09, Response No. 504, p. 80).

Most respondents viewed the City Council's inability to enforce the bylaws as stemming from two sources. First, the Council's inherent problems such as scarcity of staff and funds, and its inability to meet costs for policing all areas that did urban agriculture. Second, the fact that most people of the highest SES did the most urban agriculture and some even worked with the City Council. And since most people earned high profits from their enterprises, they usually hampered efforts to enforce the bylaws, for example, one respondent said:

It is difficult to say with certainty why the City Council does not enforce its bylaws. I can say that there are several reasons. For example, we have corrupt City Council bylaws enforcers and sometimes the violators are senior government or city officials. I think there should not be any exceptions in enforcing the bylaws, despite people's ranks and positions in the government (Respondent No. UAs 27, Response No. 1575, p. 251).

It seems that most respondents perceived senior government and public officials engaging in urban agriculture as a hindrance to the enforcement of the city bylaws. Nevertheless, others also perceived that the low salaries of some city militia forced them to accept bribes from bylaw breakers. As one respondent asserted:

You must understand that most people who keep cattle are senior officials in public

establishments. This makes it difficult to enforce the bylaws. Also, the City Council has few workers to enforce the bylaws and some are corrupt as well (Respondent No. UAs 11, Response No. 625, p. 99).

From most interviewees' responses, it appeared that their continuing to do the damaging practices was partly because they saw senior government officials doing it. The City Council took no steps to punish senior government, public, and City Council officials. That said, however, most interviewees appeared to say that to lessen further damaging the environment, the City Council had first to punish the senior officials. As one respondent remarked:

I have told you that most people working for the City Council also keep livestock making it difficult to enforce the bylaws. The other aspect is that people do urban agriculture almost all over the place, which also makes the enforcing of bylaws difficult. The City Council has little staff to do all that. Besides, you should not forget that senior government officials are also doing urban agriculture. There is nothing that can be done except to enforce the bylaws. This cannot continue indefinitely. The government and the City Council must regulate it using the bylaws that they have enacted (Respondent No. UAs 20, Response No. 1163 & 1164, p. 189).

Similarly, most agriculture/livestock extension personnel said that the City Council partially encouraged urban agriculture by not enforcing its bylaws. This failure was attributed in part to the size of the city:

The city bylaws were there but moribund. When people talk about sustainable urban agriculture, most refers to Nairobi, Kenya that has 16,000 dairy cattle, and Dar es Salaam has more than 18,000 animals. Currently, we have complaints from health people that the incidents of tetanus have increased because most of the areas are contaminated with cow dung. People also blame goats for eating up hedges around government houses. Animals are turning the city's green areas into a desert. . . . Enforcing the bylaws is difficult given the large size of Dar es Salaam. The emphasis is on the residential areas such as Oysterbay, Masaki, Mikochoeni, and Kinondoni (Respondent No. PO 22, Response Nos. 340 & 341, p. 79).

Another official's comment suggest that in part, the bylaws were unworkable:

I think that regulating livestock keeping in the city is difficult. In 1989, for example, the government and the City Council directed that livestock owners should keep their animals out of the city and in special planned areas such as Goba, Kibamba, and Ununio. Most people could not afford to do this because they had to build permanent sheds, employ more than two

herdsmen and have transportation. I personally think that the only remaining option is to enforce the City Council bylaws of only keeping four animals. For those insisting on keeping more than four animals, they must zero-graze their animals and provide them with enough feed, lest the animals die. However, most senior officials bribe the City Council workers who enforce the bylaws, and make the exercise a useless one (Respondent No. PO 23, Response No. 371, p. 84).

Tanzania had a one-party political system for three decades until 1992, and politicians virtually controlled the government's several institutions' operations and functions. Politicians made decisions that government officials should have made, a legacy that to some extent still continues. Often, politicians turned down technical and professional solutions for solving social problems simply because they had the clout and few technical and professional staff members dared to challenge them. This dilemma was also evident in the city. For example, politicians hampered efforts or vetoed actions of the City Council to regulate the keeping of livestock because it was not in their interests. One official explained:

I think we should blame the government for the environmental damage to this city and not the City Council. The government, through various leaders, often overrules or vetoes the City Council's efforts to enforce its bylaws. There is a conflict between our politicians and experts in carrying out technical issues. There are city bylaws that are not adequately enforced because of politicians with a different agenda interfere (Respondent No. PO 12, Response No. 217, p. 49).

Like most government departments and institutions, the City Council receives a large portion of its budget for its various functions from the central government. With the expansion of the city's boundaries and diverse activities, evidence suggested that the government was giving less money to the City Council. This money was not enough to pay for the city's militia, transportation, allowances, and personnel to effectively police the bylaws that purported to regulate the damaging urban agriculture. As one interviewee remarked:

Yes, the people who keep livestock have partly destroyed the beauty of the city. Animals are just a part of the destruction because I think the other part is the failure of the government to fund the City Council. The City Council cannot clean the whole city with the meagre funds it gets from the central government. This failure is because of the poor economic situation of the country (Respondent No. UAs 05, Response No. 307, p. 48).

Other officials' views appeared to support the view that the government condoned agriculture because it was morally good for the urbanites to produce their own food and get money from the enterprises. However, the huge profits earned from the enterprises motivated individuals to increase the operations that damaged the environment.

Government encouragement. There are two senses in which the data allow one to speak of government encouragement. The first is direct encouragement of agriculture that is spelled out in various government policy documents, including urban agriculture. The second is the indirect encouragement of poor, or damaging agricultural practice by a failure of MALCD agents to educate people about good practices or to monitor what urban agriculturalists do, and also the tendency for these agents to offer education about agriculture to few people, mostly the elite, who thereby intensified their enterprises. In the following pages, the first of these senses is dealt with before the second.

Of the 29 agriculturalists interviewed, 25 mentioned aspects that implied that the government encouraged people to continue doing urban agriculture. The government, through the Act of 1982, sanctioned the City Council to enact bylaws that allow a person in the city to keep four animals. In the city, the bylaws are called the Dar es Salaam City Council (Animals in City Area) Bylaws of 1990. One interviewee explained:

The Head of State has publicly encouraged keeping animals or growing crops in the city, making the issue not a problem at all. . . . He said that people should keep chickens, dairy cattle and grow African spinach so that they could increase their income. I personally think

that urban agriculture has no problems (Respondent No. UAs 09, Response No. 505, p. 80).

The problems of urban agriculture in the city were traced to the 1970s when the government issued policies encouraging urbanites to become self-sufficient in food production. As pointed out in Chapter 3, the government policy formulations have all along encouraged agriculture because it is the backbone of the country's economy that was declining. This logic was in part the bedrock of the growth of urban agriculture. However, in the 1970s and early 1980s, the nation's economy worsened and people with mid to high levels of income started doing urban agriculture, exacerbating the environmental damage, especially on public health. As one official explained:

It is good that we are encouraging people to do urban agriculture, but when we look at it from the urban health perspective, there is a problem with pollution. . . . (Respondent No. PO 14, Response Nos. & 223 & 226, pp. 50 & 51).

Other interviewees' responses implied that the 1985 government policies of trade liberalization, privatization, and the agricultural policy of 1982 also encouraged people to do urban agriculture. Through these policies, individuals, groups, and companies received most agricultural supplies such as animals, animal medications, feed, and chemicals that were once scarce. For example, drug stores, feed mixing houses, forage vendors, and private animal clinics emerged, serving mostly urban agriculturalists. One respondent said:

In the 1970s to early 1980s, the National Milling Corporation office was the place one could get chicken feed. There were unprecedented line ups. Their offices were open only open during the official work hours and it was impossible for people to instantly get the animal feed. People used to spend the whole day looking for feed and most of those people were employed in the formal sector such as the government offices and other public institutions . . . The current situation has changed because animal feed and other supplies are abundant. Now there are several companies and private individuals everywhere who sell animal feed and other animals' supplies (Respondent No. UAs 17, Response No. 983, p. 158).

Some agriculturalists' responses also implied that the government encouraged people to

do urban agriculture when in 1992 it abolished Saturday as an official working day. One purpose of the abolishment was for the people to have more time for farming, and the move appeared to have an impact on the damaging urban agriculture. One interviewee remarked:

The government has stopped using Saturday as an official working day so that most people can look after their farming activities. For example, I buy chicken feed every Saturday to last for a week. I do not use any official time to take care of any activities that involve chickens (Respondent No. UAs 17, Response No. 983, 158).

In the city, there was evidence suggesting that the government offered most senior government and public institution officials vehicles that they used for official and private duties. Some senior officials who did urban agriculture also used the vehicles in activities related to urban agriculture. For most people, these activities included transporting animal feed, forage, agricultural extension agents, and animal medications. This government policy was another which appeared to encourage people in doing urban agriculture. One interviewee's comments are typical:

Not at all, because it is part of my fringe benefits. I am entitled to a government vehicle twenty-four hours and would rather use it to help me in livestock activities than staying out late with it drinking in night clubs (Respondent No. UAs 05, Response No. 270, p. 42).

Some respondents also said that another aspect where the government seems to encourage the damaging urban agriculture was the policy that MALCD carried out. MALCD brought dairy cattle to the city from up state country farms and sold them mostly to the elite. This also happened with chickens, most of which were brought to the city from neighbouring Zambia. In the mid-1980s, Tanzania adopted an economic liberalization policy that saw the mushrooming of small to medium sized formal and informal operations serving urban agriculture. During this time, the government encouraged urban agriculture

through the three MALCD district offices that offered non formal education and sold medications to urbanites. Other interviewees said that another government policy that MALCD carried out which implicitly encouraged damaging urban agriculture to continue was deploying agricultural extension agents who offered non formal education to urbanites.

One official said:

Most urban agriculturalists grow vegetables and all the urban areas have enough extension workers to provide extension education to the people. In each area, extension workers are assigned to the streets (*mtaa*) or areas. Here the agriculture and livestock extension workers jointly teach farmers better ways of farming. The trend now is to have a general extension worker called an agro-vety (Respondent No. PO 20, Response No. 308, p. 72).

Another commented:

For example, the Ministry of Agriculture educates people about the merits and problems with urban agriculture. People are being warned against the excessive use of fertilizers. The Ministry has pamphlets that provide information about the proper ways of keeping livestock (Respondent No. PO 10, Response No. 172, p. 41).

The irony for most of the agriculture/livestock extension staff is that they could not refuse to give technical advice to some agriculturalists found to be damaging the environment. As stated earlier, the corps of urban agricultural extension agents was problematic. One problem appeared to have to do with the low level of education they receive compared to some of the people they advised. Another was their limited knowledge about the technical aspects of the very subjects they purported to teach. Besides these inabilities, evidence suggested that MALCD urban agricultural extension services were not equally available to urbanites. In this way extension agents encouraged the damaging urban agriculture in two ways. First, they gave agriculture information mostly to the elite who used it to increase their enterprises that damaged the urban environment. Unlike the colonial agriculture extension agents (1920s to 1960) who exhorted people, and often under duress, to protect

the environment, the contemporary agents did the opposite. To ensure sustainability, for example, agents of the colonial era made people de-stock their animals, build terraces and contour ditches, plant trees, forbid cultivating on mountain slopes and along rivers and streams. Second, for agriculturalists who were not reached by the agents, it meant that they were unable to get agriculture information to properly manage their enterprises and avoid damaging the environment. Evidence suggested that this inability was partly because of: the agents' low motivation to advise people of mid- and lower socioeconomic statuses, their lack of environmental education, and that most agents were female. For example, one interviewee complained:

Yes, I have some complaints to make. First, I have come to recognize that there are many livestock keepers in the city. The problem I face, and others probably face it too, is the lack of veterinary extension services and animal medications. I think veterinary extension workers should be allocated to advise livestock keepers in most areas instead of the current system where we have to find them at the animal clinic (Respondent No. UAs 15, Response No. 902, p. 145).

Another explained:

I do not get any extension advice. I go to the office to see the veterinary extension agents when my animals are sick. Nobody comes here to advise me on what I should do with the animals. Most people rely on neighbours for information. And have become "subject matter specialists" who also got the information through seeing and talking to their neighbours or friends (Respondent No. UAs 18, Response No. 1077, p. 175).

It appeared that the failure of MALCD to provide agricultural extension agents with transportation was a factor, which paradoxically encouraged poor urban agriculture, because it meant that agricultural extension agents could not easily reach most agriculturalists scattered in the city.

The view was also expressed that the effectiveness of extension agents was impaired by a controversial gender issue where some people claimed that female extension agents were

less effective in educating people about agriculture than males. At the end of 1993, evidence suggested that about 75 to 80 percent of the agricultural/livestock extension service agents were female and most married to government, ruling party, and public officials who worked in the city (see also Sawio, 1993). Most remained clustered at the district offices instead of visiting agriculturalists in their assigned areas. Furthermore, some people claimed that most female extension agents disliked working in dirty environments. Areas such as in dung-filled and dirty animal sheds, smelly and dusty chicken's sheds. Others said that most were afraid to handle large livestock such as cattle. One official stated:

I have my reservations on the issue of ineffectiveness of female livestock extension workers. Let us call a spade a spade. If one critically examines the inexperienced and experienced female extension workers, there are noticeable differences between them. Inexperienced livestock extension agents are less effective than experienced ones. My experience of working in a district revealed that those who directly come from our training institutions are less effective than their older experienced counterparts. It then follows that when females get married, their effectiveness tremendously drops. If they are married to wealthy men, they will rarely go into the cattle sheds that are full of cow dung to treat animals. I am sorry to say this because we also have female veterinary doctors who behave this way. Imagine if a female extension agent arrived in the mornings in her husband's posh car and elegantly dressed, do you think she would dare go into a dirty shed? I do not think so. Do you think she would dare go into a chicken's shed that stinks and is full of dust? Do you see what I am saying? There are certain things which male livestock extension agents do without complaining and questioning but females do (Respondent No. PO 22, Response No. 332, p. 77-78).

Another commented:

Female extension agents are more effective in dealing with poultry keeping activities than dairy cattle. Dairy cattle require that they are restrained, examined, and sometimes vaccinated--these activities require physical strength and male extension agents seem more efficient. I personally, prefer to send out male extension agents to deal with field UA activities. I retain most female extension workers here at the office to treat dogs, cats, and chickens (Respondent No. PO 27, Response No. 437, p. 96).

Another countered:

In Dar es Salaam, there are more female agriculture/livestock extension agents than male because about 75 percent are married. It is impossible to post them 30 to 40 kilometres away from their spouses who live in the city. It is not true that female extension workers are less effective. I have female extension workers who are as effective as their male counterparts (Respondent No. PO 21, Response no. 329 & 330, p. 77).

Another explained:

Personally, I think they are equally effective and we need to motivate them. Most of our extension agents want to exercise their professionalism but external factors limit them. To me, the difference between female and male agricultural/livestock extension workers is not true (Respondent No. PO 21, Response No. 331, p. 77).

It also seemed that MALCD failed to educate some livestock keepers in distinguishing between its agricultural/livestock extension agents' levels of training and experience. Because of this lack of knowledge, some livestock keepers therefore chose whatever staff member could be found in the office to consult with. This led some agriculturalists to rely on the ill-trained field auxiliaries to treat their animals and offer information about urban agriculture. MALCD administrators also failed to supervise these junior staff members and resorted to blaming livestock keepers for choosing these people. It appeared that most animal owners did this partly because of their fear of being overcharged if they reported their cases to the district veterinary doctors. However, field auxiliaries also charged livestock keepers money that they kept despite the inferior services and information they gave contrary to their bosses' approval. One official elaborated:

Most auxiliaries who have gained some experience pose as veterinary doctors and go out to treat people's animals in those capacities. We have tried to warn them, but it doesn't seem to work because of the trust they have earned from some livestock keepers. Some of these staff members abrogate the veterinary code of ethics but again farmers have the right to choose the extension worker they want. My efforts have been to tell the staff members not to call themselves veterinary doctors, and they should tell clients their level of qualification and experience. On the other hand, we should blame the livestock keepers because they have to report their cases to me [the veterinary doctor]. The normal procedure is that I evaluate a case and assign it to a competent extension agent or a veterinary officer to handle it. However, this is not followed (Respondent NO. PO 27, Response No. 439, p. 96).

Another said:

For example, field auxiliaries without training in veterinary science are treating livestock in the field. There are cases where some people have wrongly been advised to give amprorium medication to day old chicks instead of vitamins (Respondent No. PO 23, Response No. 378,

p. 85).

Finally, some people claimed that MALCD failed to change the agricultural extension agents' working time so that they could effectively offer information to most agriculturalists. For example, agricultural extension agents had the same working schedules as those of agriculturalists, which made it hard for agents to offer information about agriculture when owners were in their homes. As one official stated:

Most extension agents finish their work at 3.00 p.m., a time during which some livestock keepers are still working (Respondent No. PO 19, Response No. 289, p. 69).

#### Respondents' Views on Solutions to the Problem

This subsection briefly examines some respondents' views on solutions to the problem of livestock damaging the environment. Some solutions that respondents gave include enforcing the city's bylaws, practising zero-grazing, moving livestock to the peri-urban areas, and educating urban agriculturalists. These and other solutions are discussed below.

The methods that urban agriculturalists suggested for reducing the damage that livestock caused are similar to those that public officials mentioned. However, public officials mentioned several more solutions than agriculturalists did. Also, the latter's views on solutions to reduce urban agriculture appeared to avoid actions that would cause them to curtail their own urban agriculture activities. For example, most agriculturalist interviewees said that the people should zero-graze their livestock to reduce the damage. However, they disagreed with reducing their animals to only four as the City Council recommended. Most said that the City Council arbitrarily reached the figure of four animals, and to them the ability of individuals to zero-graze their animals would decide the number they should keep.

It appeared that to most respondents things such as the availability of forage, cost of animal medications and chemicals, and area for grazing would better dictate how many animals to keep than any regulation would.

Similarly, most agriculturalists said that to reduce livestock in the city, the City Council should enforce its bylaws that regulate them. However, most respondents opposed the City Council's actions of impounding people's livestock that were found grazing outside. On the other hand, most public officials favoured the idea of impounding livestock found grazing, and insisted that the City Council should enforce its bylaws to the letter. Some public officials also said that the City Council should use local leaders such as the *ten-cell* leaders and ward councillors to enforce the bylaws. They also suggested that agents such as agricultural extension, public health, and urban planning staff should annually inspect houses in which livestock are kept before owners are given licences.

Urban agriculturalists and public officials suggested that to reduce the damage that livestock caused to the urban environment, the government should plan and develop the peri-urban areas. Most interviewees said that the government should ensure that these areas had infrastructure such as roads, water, electricity and above all security. They also emphasized that the would-be farmers should be allocated sufficiently large plots on a permanent basis and made to get title deeds. One respondent with the City Council's Planning Unit admitted that there was a need to revisit the philosophy of urban planning and allocate areas for agriculture. He explained:

Well, I think people are responding to the realities of this country, that is, people keep dairy cattle to increase their income. . . . I think we need to realize that most people living in the city depend on urban agriculture to supplement their income. It is better that we, the town planners, come to accept the reality that our cities can no longer offer employment in the industrial sector and other service sectors. So, because most people are willing to involve

themselves in agriculture, we need to add the element of agriculture to our plan. The only way this can be done is to allocate or plan for special areas for agriculture, but not in the already planned areas. This is necessary because the future trend is toward making our plots smaller than they are now because of the cities' economics (Respondent No. PO 04, Response Nos. 64 & 65, pp. 15 & 16).

Most agriculturalists said that receiving education on agriculture and other topics could reduce their doing damaging practices. Public officials also mentioned this point as a solution to reducing the damage that animals caused in the city. It appeared that a strong correspondence existed between what agriculturalists said about the lack of agricultural information and the solutions they proposed. However, few respondents (either agriculturalists or officials) said that the government should increase salaries as a solution to reducing the damaging urban agriculture. This was also true for the issue of carrying out research on issues about urban agriculture damaging the environment. Most people argued that it was not feasible for the government to increase the salaries of its workers or give more research funds when it faced an acute economic crisis.

## SUMMARY

This chapter has examined the results of the study using three main sections. The first section looked at the agriculturalist involvement in keeping dairy cattle. It was observed that interviewees in the high and quasi-medium quality housing areas had more dairy cattle than those in the medium and low quality housing areas. Respondents kept livestock as economic enterprises even when they had the infrastructure for growing some field crops

and vegetables. Most interviewees kept dairy cattle crosses of Boran and other exotic breeds of the Ayrshire, Friesian, Guernsey, and Jersey cattle. But interviewees got low yields of milk from these cows, probably because they gave them inadequate feed that could not sustain their production and maintenance needs. Hiring labour in urban agriculture enterprises was common among people living in high quality government housing and quasi-medium quality housing, especially in households keeping dairy cattle and chickens. Most shed roofs for dairy cattle were made out of used corrugated iron sheets, while the walls were either made of concrete bricks, tree barks, or old pieces of wooden boards and poles. Most shed floors were made of concrete.

All of the commercial chickens raised in Dar es Salaam are for eggs and broiler meat, and mostly consist of the exotic cross breeds. Most respondents kept chickens under the deep litter system in which sawdust was a common litter material. Other livestock that agriculturalists kept included ducks, goats, local fowls, rabbits, and sheep. In the built and developed areas of the city, most people keep dairy cattle, laying and broiler chickens to earn money. From these enterprises, respondents earned a total average annual net profit of T Shs 36.9 million (US\$ 76,875), an average per respondent of T Shs 1.3 million (US\$ 2,708), with range of individual profit from a low of T Shs 86,400 (US\$ 180) to a high of T Shs 5.6 million (US\$ 11,667) (see Appendix 14). These profits are greater than the annual net earnings many people got from their salaried jobs. These earnings appeared to support the claims most people made that urban agriculture was mainly done to earn money and relieve them of the economic austerity they endured. They also supported the claim that there is a positive relationship between level of salaried income and level of agricultural

earnings.

Both crop and livestock activities appeared to damage the environment and the severity of the damage depended on location and management. In some respondents' compounds, cattle and goats had damaged the crops and flowers that people grew, especially if the owners let their animals wander around. Most households had animal dung around their compounds, contributing to environmental degradation. Most respondents, however, said that they piled animal dung so that they could later sell it to people growing amaranths. Most people built sheds for dairy cattle with makeshift materials, contributing to the ugliness of the city. This was common in the government, public institution, company, and rented houses. Goats had also devoured most of the hedges in residential areas causing extensive damage to the urban environment. The chickens' deep litter systems contributed enormously to odour problems because the chicken dung comes out with urine that contains uric acid. Also, chickens in residential areas made noises that disturbed other urbanites.

Most agriculturalists interviewed agreed with most of the statements about the damaging effects of urban agriculture pertaining to four animal-related issues: psycho-social, socio-political-legal, those related to accidents, and to city-landscape. However, few respondents agreed with statements about the damaging effects of urban agriculture on issues related to disease-health. The main bases for respondents' beliefs on most issues was their personal experience.

Of the 27 public officials, 24 (ten agricultural extension agents and 14 city officials) agreed that most people doing urban agriculture were aware of the damaging effects their activities had on the environment. Yet three public officials, despite acknowledging that most urban

agriculturalists knew the damaging aspects of urban agriculture, said that most lacked a scientific understanding of its impact on public health. In the city, NEMC offered information to urbanites to lessen environmental degradation due to urban agriculture. However, MALCD relies on agricultural extension agents to go out and teach agriculturalists on matters about agricultural production, and not about lessening the environmental degradation that urban agriculture appeared to cause. Evidence suggests that most agents cannot give advice on the latter because they do not have training in environmental education.

Most respondents did not consider that the damaging statements about livestock applied to them, but only to others. Information that some respondents had related to disease-health issues was often not accurate. It appeared that this was true also for the scientific type of information that urban agriculturalists obtained from "other people say" type of sources. Although MALCD and NEMC offer education programs to urban agriculturalists, it appeared that these educational endeavours were not matched to urban agriculturalists' needs in several respects.

The main reasons that people gave for continuing to do damaging urban agriculture were economic and nutritional. Most respondents said that doing urban agriculture for economic reasons was the most important of the reasons, and that people undertook urban agriculture as an informal way of alleviating the persistent national economic hardship felt by most urbanites. All ten agriculture/livestock extension personnel interviewed also said that people did urban agriculture for economic survival. Most public officials also agreed that livestock keeping was on the increase because most people earned high profits that

supplemented the income earned from their formal jobs. They perceived that this was important in an economy facing high inflation rates that erode people's income.

Most respondents thought that doing urban agriculture for nutritional needs was related to the reason of economic survival. Most respondents shared the common thinking of Tanzanians that people with enough money can also buy enough food for their households. Most respondents' views about individual motivations for doing urban agriculture appeared to suggest that they are a manifestation of problems inherent in the social, economic and political structure of Tanzania, of which the city of Dar es Salaam is a part.

Of the 29 agricultural interviewees, twenty-two responded to the "reason for continuation" question: Why doesn't the City Council enforce the bylaws? Most interviewees said that most people continued to do damaging urban agriculture partly because the City Council did not enforce its bylaws. They also said that although there were bylaws to regulate urban agriculture, most people violated them grossly, especially senior government officials. Most agriculturalists interviewed mentioned aspects implying that the government implicitly encouraged people to continue doing urban agriculture. The government, through the Act of 1982, sanctioned the City Council to enact bylaws that allow a person in the city to keep four animals. The government also allowed its officials to use its premises for urban agriculture. Other interviewees' responses implied that the 1985 government policies of trade liberalization, privatization, and the agricultural policy of 1982 also encouraged most people to do urban agriculture. Some agriculturalists' responses also implied that the government encouraged people to do urban agriculture when in 1992 it abolished Saturday as an official working day.

In the city, evidence suggested that the government offered most senior government and public institution officials vehicles that they used for official and private duties. Often politicians turned down technical and professional solutions to social problems simply because they had the clout and few technical and professional staff members dared to challenge them. With the expansion of the city's boundaries and diverse activities, evidence suggested that the government was giving less money to the City Council. Some respondents also said that another way the government encouraged urban agriculture was the policy that MACLD carried out. For example, MALCD brought dairy cattle to the city from up country state farms and sold them mostly to the elite, and extension agents offered non formal education mostly to the elite as well. Other factors which worked against a reduction of urban agriculture were the lack of transportation for agricultural extension agents, having too many female extension agents, not supervising the field auxiliaries, and not changing the working time of agricultural extension agents.

Solutions that agriculturalists and public officials gave for reducing environmental degradation due to urban agriculture included enforcing the city's bylaws, practising zero-grazing, moving livestock to the peri-urban areas, and educating urban agriculturalists.

## **CHAPTER SIX**

### **DISCUSSION AND CONCLUSION**

This chapter is organized into three main sections. The first section provides a summary of the findings and the next one examines the explanations for why people persist in doing urban agriculture in spite of its damaging effects. This section incorporates the study results, the literature and other studies reviewed on urban agriculture to discuss factors nested at four contextual levels: government, ministry, City Council, and individual for the persistence of urban agriculture. The third section looks at the conclusions and recommendations of this study and has three subsections: limitation of the study, conclusions, and recommendations. The latter has two subsections, one on policy and practice, and the other on further research.

### **SUMMARY OF FINDINGS**

The purpose of this study was to explain the persistence of urban agriculture in Dar es Salaam in the light of its evident damaging effects on the urban environment. This broad question was pursued by examining several more specific ones:

- 1) What is the nature of urban agriculture in Dar es Salaam?
- 2) What damaging effects result from urban agriculture?
- 3) To what extent do people have information about urban agriculture and

its effects?

- 4) What is the nature and structure of government policies, agricultural extension and City bylaws regarding urban agriculture?
- 5) What is the nature and structure of economic, social, and cultural factors concerning urban agriculture?

Data were obtained through (a) secondary sources (b) government reports and statistics, and (c) field data from interviews and observations. The field data were obtained from interviews with 29 urban agriculturalists and 27 public officials whose work made them knowledgeable about the issues explored in the study. Field data also included the researcher's observations of the agricultural practices of the agriculturalist respondents.

The history of Tanzania since independence in 1961 shows a succession of economic crises precipitated by national disasters and an inadequate resource base for coping with them. Government policies show a series of different kinds of economic planning attempts to reverse a continuous erosion of economic health. In the context of modern Tanzania, agriculture--including urban agriculture--accounts for 48 percent of the GNP and has been encouraged by government policies over more than thirty years. In Dar es Salaam, several prior studies have shown the extensiveness of urban agriculture and have suggested that one reason for its pervasiveness is that it enables people to supplement their otherwise meagre incomes.

A review of the literature shows that urban agriculture is a global phenomenon. In developing countries it is frequently practised by the poor segment of the population and is an important supplement for both income and nutrition. In Tanzania, and particularly

in Dar es Salaam, its practise is not restricted to the low income population, but is found among people of all income ranges. While it is clear that urban agriculture can have many beneficial effects, there is ample evidence to show that it can significantly damage the urban environment. Such damage can be social, aesthetic, and health related. Against this background the field data were collected to obtain a picture (1) of what kind of urban agriculture was practised in different areas of Dar es Salaam, (2) of the extent to which it damaged the environment and (3) of the degree to which people knew of the damage it caused, and (4) of the reasons they gave for continuing to do agriculture in spite of its damaging effects.

At the end of 1993, the 29 urban agriculturalist respondents kept 47 dairy cows, 8,750 broiler chickens, and 2,670 egg-laying chickens. From these animals, people sold milk, eggs, and broiler meat that earned them a total annual net profit of T Shs 36.9 million (US\$ 76,875), with an annual net profit per person ranging from T Shs 86,000 (US\$ 180) to T Shs 5,558,400 (US\$ 11,580). The overall average per person was T Shs 1.3 million (US\$ 2,708) which is 15 times than the average salary income of a low income worker, and 6 times more than that of a senior official. The study found that most of the 29 agriculturalists expressed agreement with most statements about environmental damage due to keeping livestock. However, less than half of them agreed with statements related to disease-health issues. The findings also showed that most agriculturalists' attributed environmental damage to others' practices rather than their own and based their beliefs about damage on their personal experience or hearsay. It was also noted that many of their beliefs were erroneous. Most public officials interviewed said that most urban agriculturalists were aware of the

environmental damage caused by their enterprises. They also said that most agriculturalists were not knowledgeable about the scientific damaging effects of urban agriculture and its impact on public health.

The study also showed that most respondents said that people engaged in urban agriculture out of economic motivations. They considered that obtaining food was a secondary reason, and that culture and getting manure were the least important reasons. Most interviewees agreed that damaging urban agriculture was encouraged in part because the City Council did not enforce its bylaws. Respondents also remarked that several government policies encouraged the continuation of damaging urban agriculture either directly or indirectly because of the inefficient education and monitoring mechanisms. Suggested solutions to the problem included the enforcement of regulations, inspection, planning and developing of per-urban areas, and delivering of educational programs.

On the basis of these findings we can now turn to an examination of the study's basic question and consider how to explain the persistence of urban agriculture, notwithstanding its evident damaging effects on the urban environment.

#### **EXPLANATIONS FOR WHY PEOPLE PERSIST IN DOING URBAN AGRICULTURE IN SPITE OF ITS DAMAGING EFFECTS**

It is clear from the examination of the Tanzanian context in Chapter 2, from the review of literature on urban agriculture world-wide in Chapter 3 and from the detailed field data of this study, that the persistence of urban agriculture is a complex phenomenon. Figure

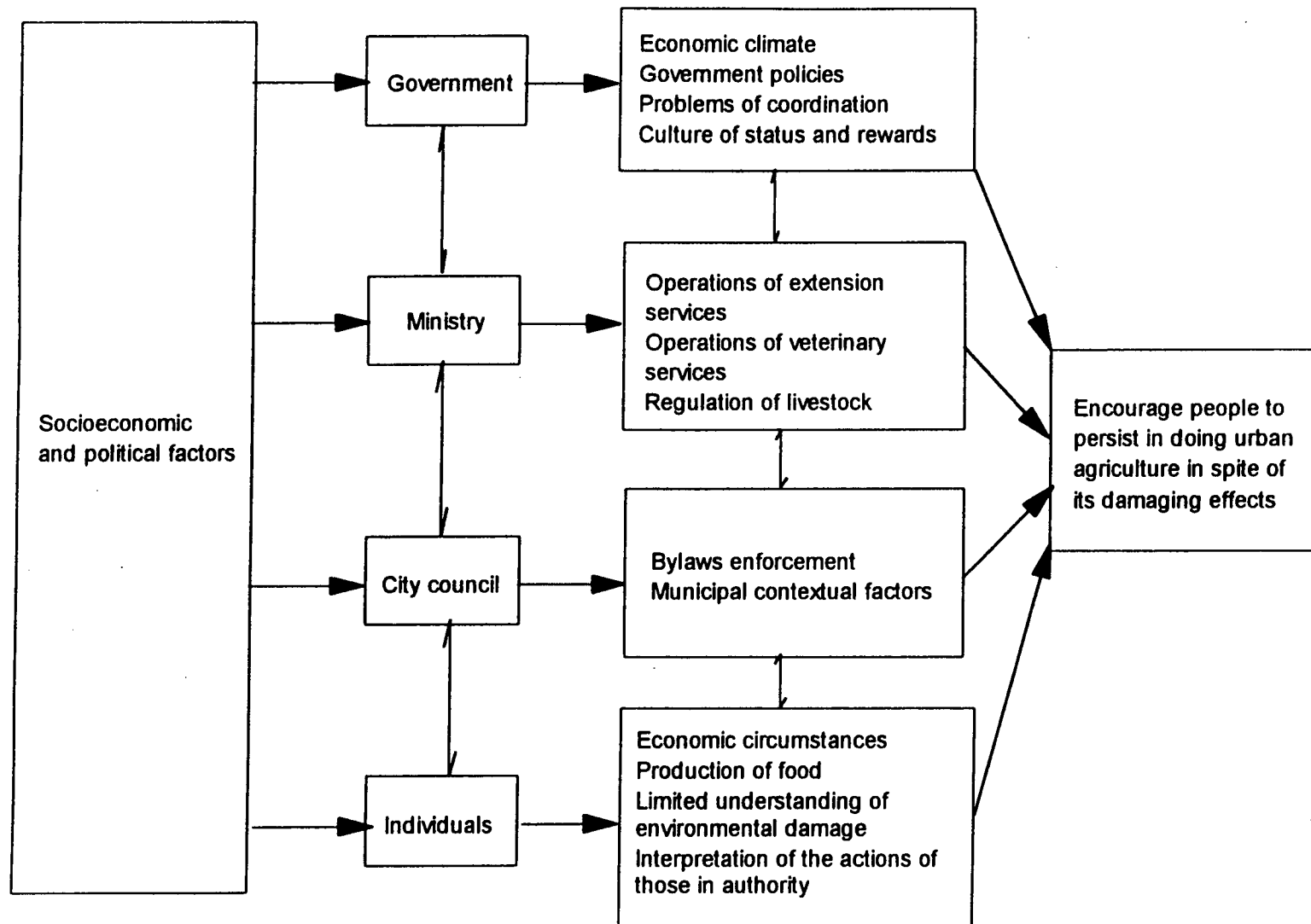


Figure 2. Model Showing Factors Nested at Four Contextual Levels to Explain People's Persistence in Doing Urban Agriculture in Spite of Its Damaging Effects.

2 portrays a model which helps to understand the complexity.

The figure shows socioeconomic and political factors nested within four levels: government, ministry, City Council, and the individual. Factors at these four levels interact with each other and beyond their boundaries. For example, the study found that people of high socioeconomic status and with more political power did more urban agriculture than others. This was so because of factors existing at the levels of government, Ministry and City Council. For each of the four levels, Figure 2 identifies what seem to be the most important factors, on the basis of the findings of the present study. In the following paragraphs each level is discussed under a separate heading and within those subsections, discussions of each factor are presented.

#### Government Level Factors

Four factors at the government level emerged from the study as encouraging people to persist in doing urban agriculture in spite of its damaging effects. These were (1) the national economic climate, (2) government policies, (3) problems of coordination, and (4) the culture of status and rewards for senior officials and the elite. Each of these factors is discussed below.

Economic climate. The findings of this study that are supported by the literature reviewed, found that national economic hardship was among the main causes cited for people to continue doing urban agriculture. Tanzania's economic crises since independence were discussed in Chapter 2, and Chapter 3 further discussed the importance of urban

agriculture in relieving these crises. The data reported in Chapter 5 showed that many people earned more money from their urban agriculture enterprises than from their salaried employment. Tanzania's inability adequately to remunerate its elite, bureaucrats, and other workers lies in its dependence on its main export crops (coffee, cotton, tea, sisal). These crops have been extremely vulnerable to economic fluctuations, and have declined both in quantity exported and in the prices obtained in the world market. Also, the country is among the 25 poorest countries in the world and the World Bank lists it as among the "debt distressed" low income countries. It is also classified as a severely indebted low income country based on the 1992 gross national product (GNP) figures of countries with per capita incomes below \$675 US. As was seen in Chapter 2, the persistent economic malaise of the 1970s to the early 1990s included an acute shortage of foreign exchange and an unsuitable balance of payment deficits, large budget deficits, high rates of inflation, and the decline of urban income. In Tanzania, urbanites of the highest and medium-class households suffered the greatest declines in real income. It was for these reasons that urban agriculture enterprises were important to solving the urbanites' socioeconomic problems.

Table 7 in Chapter 3 page 66 displays data collected in 1991 by TNIS in Dar es Salaam, which shows that the people who did UA earned an average annual profit of T Shs 115,000 (US\$ 460.0). This figure was 2.3 times more than the low income earners' annual take home salary (after deducting 30 percent taxation). Data for this study collected in 1993 in Dar es Salaam and presented in Appendix 14 on page 290 showed that each of the 29 urban agriculturalists earned an average total annual net profit of T Shs 1.3 million (US\$ 2,650). The extraordinary difference in the latter figures is due to the fact that they represent sales

of livestock products (milk, eggs, broiler meat) that yield higher profits than vegetable sales. Also, data of earnings from urban agriculture presented in Tables 16 to 19 on page 126 to 129 showed that agriculturalists realised on average 15 times more than the net annual salary income of a low income worker, and six times that of a senior public official.

The findings of this study suggest that urban agriculture in the city was not a marginal activity. Findings of this study are consistent with other urban agriculture studies in Tanzania and Dar es Salaam reported in Chapter 3, which show that people do urban agriculture because of the national economic austerity. However, these Tanzanian studies on urban agriculture are at variance with those done in other cities in Africa. They report that urban agriculture is mostly a preoccupation of the poor people who do it for subsistence purposes. In the present study the involvement of higher status people is clearly seen, and they, too did urban agriculture for economic reasons.

Government policies. Both groups of interviewees in the present study agreed that most people persisted in doing urban agriculture in spite of its damaging effects in part because the government encouraged it both directly and indirectly. As was seen in Chapter 2, the government directly encouraged urban agriculture through policy promulgations that are mentioned in several documents. These date from the 1970s to the present and Table 8 page 89 shows an example of two levels at which policies affecting urban agriculture are made. These two levels are the government and the Dar es Salaam City Council (DCC). The national policies encourage urban agriculture, while those of the DCC regulate it. Relevant government policies that encouraged urban agriculture are the national economic

policies, and the agricultural policies. Those that regulate it are contained in the Act of 1982 that allowed Local Governments (Urban Authorities) to enact bylaws to regulate urban agriculture in their jurisdictions (see Table 8). From the 1970s to the 1980s, the government, faced with a poor economy, has been issuing policies encouraging people to do urban agriculture. The aim was for self-sufficiency in growing food to offset skyrocketing inflation of goods and services in towns and cities. Government and political leaders time and again exhorted urban people to produce food in their backyards and other open spaces.

The mid-1980s economic liberalization and privatization policies enabled the government to allow individuals and groups to open animal clinics, most of which are owned by government-employed veterinary doctors. At the end of 1993, there were three private animal clinics operating in two districts; two in Kinondoni and one in Temeke. Unlike those in western countries, these clinics treat mostly urban livestock and operate on a part time basis, employing government veterinary doctors and assistants. Those policies also encouraged privately operated drug stores, farm stores, feed compounding houses, forage vending, and sales of animal medications, feed, chemicals, animal minerals, fertilizers, and forage to urban agriculturalists. Often, owners of the animal clinics, drug stores, and farm stores bought their medications from the government veterinary clinics and stores at subsidized prices and sold them at higher prices to earn themselves substantial profits.

Another encouragement for doing urban agriculture was that the government appeared to favour urban people over those in rural areas. There were two examples of this scenario. The first was the concentration of agriculture extension services. Despite the fact that the city itself had only about 1.0 percent of the total cattle in the country, it was in the city that

one could most easily obtain medications, fertilizers, acaricide, and herbicides instead of in the outer regions. The second example was the increased sales of crossbred cattle to senior government, ruling party officials, and other bureaucrats who reared the animals mostly in the city. In the mid-1980s, the government initiated a fund for agricultural credits which the Cooperative and Rural Development Bank and the National Bank of Commerce administered for disbursement (United Republic of Tanzania, 1990a). The aim of the fund was primarily to help rural people and low income urban people start farming in rural areas. However, the credits became capital sources for senior government, ruling party, and public officials' urban based enterprises with which they bought the expensive dairy cattle, broiler and egg laying chickens. A similar program provided funds for agricultural credits for low income women, but most of the money was lent to well-off women and the spouses of the elite and bureaucrats who further intensified their urban agriculture enterprises. It is in this context that the State's policies appeared to encourage people of high socioeconomic status and those with political clout to persist in urban agriculture.

Recently there have been some contradicting pressures. The government has been increasingly pressured from within its political echelons to set a policy to lessen environmental damage caused by urban agriculture. Literature, especially that contained in the city's main newspapers, reveals that some Members of Parliament become increasingly intolerant of the damaging effects of urban agriculture. During the Budget sessions of 1993 some MPs had demanded the Minister for Home Affairs, and the Minister responsible for the upkeep of government houses to act. They demanded that they prohibit urban herdsmen from keeping dairy cattle, goats, pigs, and chickens in the garage courts and

servants' quarters of government houses. Also the heated debates by Members of Parliament in this year's [1991] Budget session of the National Assembly on haphazard livestock keeping in many urban areas seem to discourage more than encourage urban agriculture (Mvena et al., 1991, p. 99). As some of the data for this study showed, some agriculturalists considered moving their livestock to the peri-urban areas to avoid such criticisms.

Problems of coordination. The findings of this study also suggest that there was a lack of coordination among some government ministries, departments, public institutions, the public, and the private sector. The lack of coordination seemed to be because the government did not support efforts to lessen environmental damage. For example, the National Environmental Management Council, a national institution, often gave advice to the City Council, the Ministry of Town and Urban Planning, and MALCD for reducing beach erosion caused by livestock. But at the same time, the government, through MALCD, was encouraging senior officials and other bureaucrats living along the beaches to keep cattle by selling animals to them and offering advice. Another example was that of the Ministry of Health. Its personnel advised urbanites to cut tall grass and remove garbage from their compounds to reduce disease epidemics. But the government, through MALCD, deployed its extension agents who encouraged people to keep more livestock and grow crops to increase their income and produce their own food. Clearly, this encouragement was designed for people in rural areas, but was given also to urban ones, this was an example of lack of coordination between different Ministries. Studies on urban agriculture in Harare,

Zimbabwe (Drakakis-Smith et al., 1995; Mbiba, 1994) found similar results because the urban hierarchy of city officials involved in controlling urban agriculture was complex. To solve this, in 1992, the United Nations Centre for Human Settlements (Habitat) initiated a project in Dar es Salaam called the Sustainable Dar es Salaam Project. The project's aims are to "both coordinate the development activities of all the key actors as well as to promote their participation in all sectors of the city's community: popular, private and public" (Halla, 1994, p. 19).

Culture of status and rewards. There is a particular culture of status and rewards among the elite and senior officials of government, public institutions, ruling party, and private companies. People of high socioeconomic status and political clout enjoy several privileges that the government provides and which can be used in their pursuit of urban agriculture. Such people live in high quality housing areas, and the government or their institutions gives them ample rewards or fringe benefits. For example, senior officers lived in houses with large plots in which they kept dairy cattle, chickens and goats. Most houses have infrastructure, garage courts and servant quarters that are often converted to cattle sheds and chicken units. The study also revealed that the government often did not enforce regulations that forbid officials from keeping livestock on their premises. The government also provides senior officials with vehicles for transportation to and from their offices, but most respondents of this type used these vehicles for urban agriculture chores. Some officials also intensified their enterprises with the allowances (e.g., travel) that the government gave them whenever they were away from their offices on official duties.

Table 19 in Chapter 5 showed that agriculturalists with high annual net salary earnings were more likely than others to have high incomes from their urban agriculture enterprises. These findings are consistent with the national economic literature reviewed in Chapter 2, and the findings of urban agriculture earnings that the Tanzania National Informal Sector reports. They all point out that from the 1970s to 1980s, most high income earners after being hit hard economically, switched their activities to include activities such as urban agriculture to maintain their real incomes. Other studies on urban agriculture done in Dar es Salaam and other towns in Tanzania reviewed in Chapter 3 also confirm this. For example, Mtweve (1987, p. 7) writes that "The assumption people make that the low-income urban people are the ones engaged in farming is not true. The high-income people are the majority in the business." Studies on women's activities done in poor parts of the city also found similar results. For example, Tripp (1989) and Koda et al. (1989) found that women belonging to the middle- and upper-income brackets were engaged in lucrative businesses like raising chickens, pigs or dairy cattle. Because of the culture of status and rewards these people enjoyed they broke the city's bylaws with impunity, were rarely punished, and persisted in their urban agriculture in spite of damaging effects. There were two main reasons for this. First, such individuals had power and could complain about being disturbed by the city worker(s) to some of their acquaintances at the City Council who would in turn reprimand the worker(s). Second, other elite and privileged individuals could offer bribes to the city workers in order to continue to break the bylaws.

### Ministerial Level Factors

This section discusses three factors at the level of the Ministry of Agriculture, Livestock and Cooperative Development (MALCD) that encouraged people to persist in doing urban agriculture in spite of its damaging effects. These factors are the operations of extension services, operations of veterinary services, and regulation of livestock.

Operations of extension services. Tanzania established urban extension services partly because of the abundant literature and studies on rural-based agriculture and livestock extension services that show, other factors held constant, extension services can improve farmers productivity because of the education they offer. However, this study revealed that the MALCD extension agents were not effective in educating agriculturalists in proportion to their numbers (for example, most people relied on personal experience and not on information from agents as the basis for most of their beliefs about environmental damage). Reasons for the agents' ineffectiveness can be found in a number of aspects of the MALCD operation: uneven offering of extension service depending on social status, inadequate resource provision and inadequate training of agents.

The findings of this study showed that MALCD extension agents offered uneven extension services that were biased toward the elite and bureaucrats. For example, Table 11 on page 116 showed that of the 29 urban agriculturalists interviewed for this study, 14 received urban agriculture information from MALCD extension agents, and 13 of those lived in the high and quasi-medium quality housing areas. There were three reasons for extension personnel to prefer to serve the elite and bureaucratic urban agriculturalists. First, the elite rewarded

the extension agents (e.g., gave money or food items) whenever they showed up. Second, they were proud to be associated with working with the elite and bureaucrats. Third, the elite and bureaucrats provided more transportation to extension agents than the low and medium income people could. As a result of these things, this study showed that the issue of the elite and bureaucrats paying extension workers was ubiquitous, as one official interviewed said:

Most people keeping dairy cattle are getting good money from their enterprises and pay for the services provided by the extension workers. Most dairy cattle keepers have made their own "private doctors" out of the government livestock extension veterinary workers. Livestock owners call upon extension workers to attend to their sick cows. . . . Most livestock extension workers finish their work at 3.00 p.m., a time during which most livestock keepers are still working. This makes it necessary for extension workers to visit livestock keepers after work hours and on weekends. I also call them to look after my animals and pay them accordingly (Respondent No. PO 19, Response No. 287 & 289, p. 69).

Inadequate resources given to the operation of MALCD agents had consequences in a number of ways. Poor funding of MALCD extension services was systemic and a chronic problem entwined in the broader context of the country's economic malaise. Poor funding of extension services affected the functions related to supervision of agents, the effectiveness of extension agents themselves, and the quality of information agents gave to agriculturalists. District offices had no transportation to supervise their extension agents. Because they were not supervised, little was known about what went on in the field and who got what in terms of agriculture/livestock information. Evidence suggested that because of lack of funds to mount supervision, district extension personnel were demoralized. District officers and some agents complained that they lacked transportation to visit most of their work areas. Field

data collected for this study is illustrative. At the end of 1993, there were 309 extension agents in the three district offices. In the fiscal year of 1992/93, the districts received T Shs 3,250,000 (US\$ 6,771) from MALCD headquarters to run most of their extension services. Given this, the annual expenditure per extension agent was a pittance of T Shs 10,518 (US\$ 22) or T Shs 39 (US\$ 0.08) for each of the 270 effective working days. This was extremely low if compared at the time to a single bus fare that cost T Shs 70 (US\$ 0.15) or a litre of gasoline costing T Shs 250 (US\$ 0.52). This field data supported results of this study and people's claims that the trend of agents to demand payments from agriculturalists in part grew out of a lack of funds for adequately supervising agents. Most agents claimed that the money they demanded from agriculturalists was partly to refund their transportation costs. Findings of this study revealed that this was the essence of the unevenness of extension services' growth, that is, those who could provide transportation and pay the agents received the most advice. This explained the penchant of most trained extension agents to advise the elite and bureaucrats because they were handsomely remunerated, an idea that field auxiliaries also took advantage of later on.

Furthermore, the working hours of extension agents complicated their offering of expertise. In the city, extension agents started work when most of their clients did. That is, from 7:30 a.m. to 3:30 p.m. And when agents went to visit livestock owners, they were at work and did not benefit from the first-hand information. The findings of this study also showed that agents ended up giving advice to labourers, herdsmen or relatives because their clients-to-be were in their offices. This was an anomaly of MALCD's function that was "accustomed to the traditional rural-based extension service, even the urban based extension

is organized to suit the rural environments" (Mvena et al., 1991, p. 90). It might also be noted in this context that several respondents said that the inadequate provision of service was due in part to the number of female agents who preferred to work in the district office, rather than in the field.

Another issue that this study has uncovered is the lack of adequate training of the extension agents. Their inadequate training led them to give mediocre advice to agriculturalists, some of whom were more highly educated than the agents, and so ironically used the information to increase livestock that further damaged the environment. The training inadequacy was inherent within the MALCD training institutions, in that their syllabi were mainly aimed at producing rurally-oriented extension agents, and gave priority not to reducing livestock numbers, but to increasing them. In the city, the bylaws for regulating livestock empowered extension agents to inspect owners' premises before issuing permits. But the agents rarely did annual inspections of premises before issuing permits. Moreover, most agents had no environmental education that they could refer to when advising agriculturalists. For example, like some interviewees in the city, some extension agents were not sure whether cow dung was a precursor of the deadly tetanus bacteria.

Operations of veterinary services. MALCD, through its three district offices in Ilala, Kinondoni, and Temeke, operated livestock offices that served as animal clinics and also sold animal medications and acaricide to livestock keepers as well as sometimes treating sick animals. The extension agents at the office gave information to livestock keepers on how to use the medications acquired. As results of this study showed, it was in this context,

where MALCD sells supplies, that the apparently helpful service may contribute to environmental damage. For example, the unsupervised antibiotics use in treating mastitis in dairy cows might have caused the increased incidence of the disease because of bacteria resistance. What might be worse is the damaging effects on people's health who might have drunk the contaminated milk because there were no milk testing procedures.

MALCD also coordinated efforts to bring dairy cattle from the State up-country dairy farms and ranches. Dairy cattle were expensive and hard to get and mostly sold to government and ruling party officials. This single factor seems largely responsible for the abundance of cattle among the elite and bureaucrats. Field observations for this study also revealed that government vehicles, staff, funds, and other resources were used to transport dairy cattle from as far as 300 to 1,000 kilometres away to MALCD headquarters in Dar es Salaam. The ministry also oversees hatchery poultry farms (e.g., Majohe, Vingunguti) and the National Poultry Company that sell the day old chicks for eggs and broiler meat to urbanites. Still another institution is the Tanzania Animal Feed Manufacturing Company that sells formulated and mixed animal feed to urban agriculturalists. The presence and easy accessibility of veterinary services, extension services, medicines and pesticides have enormously contributed to a rapid growth in agriculture and keeping livestock in urban areas (Mosha, 1991, p. 88).

Regulation of livestock. The government had empowered MALCD, through its extension personnel, to inspect agriculturalists' compounds to see if they were suitable for agriculture activities. If they are satisfied that the agriculture practised does not damage the

environment, the agents issue permits that the agriculturalists take to the City Council officials when obtaining licenses to do urban agriculture. Extension agents as a way of encouraging agriculture in the city they often performed sloppy inspections and issued permits haphazardly. One official underscored this point by saying:

The regional livestock officer directly oversees all animals kept in the city. Livestock owners have to obtain annual permits and then licenses after paying a fee. One is given a permit and subsequently a license if he or she only keeps four dairy cattle in the city. However, some personnel at the livestock district offices do not follow this procedure. . . . (Respondent No. PO 11, Response No. 188, p. 44).

#### City Council Level Factors

The findings of this study appeared to point to two City Council factors that encouraged people to persist in doing urban agriculture in spite of its damaging effects. These factors are laxity in enforcing the city bylaws, and municipal contextual factors.

Bylaws enforcement. Both groups of interviewees agreed that most people persisted in doing urban agriculture in spite its damaging effects because the City Council did not enforce its bylaws. On the issue of bylaws enforcement, literature and studies appear to point out two problems. (1) In most Third World societies in which urban poor do the most urban agriculture for subsistence purposes, city councils were inadequately enforcing bylaws that regulated the practices. In part, the inability of city councils to enforce bylaws appears to stem from a moral and humanitarian dilemma: people doing urban agriculture are poor, and they do it to meet their basic food needs. A review of studies on urban agriculture of most Third World societies appeared to suggest that most cities' bylaws were becoming

more accommodating to the practices than prohibitive. There seems to be no possibility of halting urban cultivation, given its economic value to urban residents (Mbiba, 1994, p. 200). This was becoming necessary because most countries were experiencing worsened economies, high rates of inflation, rural-urban migrations, and dwindling formal sectors. Cities had no alternatives to offer to the people as a deterrent from breaking the bylaws.

(2) There are few Third World societies in which members of government and ruling party elites do the most urban agriculture for profit maximization. Here, enforcing bylaws was problematic, and Dar es Salaam was typical. Here, the inability of city councils to enforce bylaws appeared impeded by hegemonic and economic considerations. This group of urban agriculturalists had administrative, economic, legal, and political power and did urban agriculture mainly because of the national economic hardship that affected them. City Council's inability to enforce its bylaws was partly the result of the city's socioeconomic, hegemonic, political, and cultural mosaic. As was pointed out in Chapter 3, the national agricultural policy encouraged urban agriculture, while the DCC regulated it. In the early 1980s, government policies encouraging urban agriculture, especially livestock keeping, started to have negative effects on the operations of most urban councils and their physical environments. To curb this, in 1982, town, municipal, and city councils, with government approval, reenacted moribund bylaws from 1949 to regulate animals in their urban centres. For example, section 80 of the Local Government Authorities Act of 1982 gives power to Urban Authorities to have their own bylaws to regulate urban agriculture. The city of Dar es Salaam had two revisions, and the 1990 bylaws was the most recent one. Field data, literature and studies reviewed show that the unprecedented increase in the number of

animals experienced in the 1980s prompted the City Council to act. Besides its bylaws, it also exhorted livestock keepers through the mass media e.g., the *Daily News* and the State radio to keep only four cattle, to not keep them in residential buildings, and to zero-graze them. All these efforts were futile and from January to July 1993, the City Council impounded roaming cattle and goats to teach livestock keepers a lesson. The enforcement of these bylaws has been an uphill battle for the city solicitor. As Mvena et al. (1991) found, virtually every bylaw in the city was flouted. Table 6 page 65 in Chapter 2 is illustrative. From 1985 to 1993, dairy cattle had increased by 451 percent, laying chickens by 45 percent, broiler chickens by 287 percent, and goats by over 2,000 percent. Clearly, these statistics support the claim that the bylaws were inadequately enforced.

One root cause of bylaw delinquency was in large part inherent within senior government and ruling party echelons whose members also did urban agriculture. Their presence as agriculturalists rendered the city's regulation ineffective as some senior government and ruling party officials often disapproved of and ridiculed City Council's officials' efforts to reduce livestock numbers in the city. For example, some respondents said that some senior officials blocked the City Council militia's efforts to book them when found to have broken the bylaws; they refused to cooperate with them and voiced reprisals. It was also said that some senior government and ruling party officials openly criticised City Councils' policy of lessening livestock in the city.

It also needs to be noted, however, that criticism of the bylaws seems not restricted to the elite. Sawio (1993) found that 60 percent of his respondents said that City Councils' urban agriculture bylaws were unrealistic. To explain this, studies that support this view give

several plausible reasons. First, "virtually all bylaws have been ignored by most urban farmers including the law makers themselves" (Mvena, et al., 1991, p. 79-85). Second, people broke the bylaws despite the City Council's efforts to announce them in the city's newspapers (e.g., the *Daily News*). Third, "this is because there is poor town planning and enforcement of development control arising from using out-dated planning legislation to deal with modern problems" (Mosha, 1991, p. 81). These views were partially true, but as respondents in this study said, it seemed also to be the case that urbanites saw and emulated what the elite and bureaucrats did, and this thwarted City Council's efforts to enforce bylaws. It appears, therefore, that for DCC to be able to regulate urban agriculture, as required by legal documents, the elite and bureaucrats have to embrace the logic of sustainable urban agriculture, that is, to stop contravening bylaws.

In summary, enforcing these bylaws in the city had been problematic for five main reasons. First, the DCC received little support in enforcing the bylaws from some officials of the central government because they also did urban agriculture. Second, the DCC corps of professionals was often frustrated because their efforts to enforce the bylaws were blocked by some powerful government bureaucrats and politicians who also did urban agriculture for economic reasons. Third, there were some DCC officials who also did urban agriculture for economic reasons and so blocked moves to enforce the bylaws for their own interests. Fourth, some empowered junior DCC staff who enforced the bylaws were corrupt and rendered the exercise futile. Fifth, the city had expanded so much and operated with too few fiscal, logistical, and employee resources to enforce the bylaws meaningfully.

Municipal contextual factors. There were two main municipal contextual factors that encouraged people to persist in urban agriculture: the presence of markets and the infrastructure (open spaces, houses, water, roads). Results of this study supported the literature reviewed in Chapter 3 which showed that fungible income was another benefit of the practices because of the available urban markets. Findings of this study and other studies on urban agriculture in the city appear to suggest that the long held view that these practices are preserves of the poor to get their food to survive is partially tenable. This study showed that agriculturalists in the city were responding more to supply and demand rules, and the elite and bureaucrats appeared to be leaders in this. In part, this was due to both a rise in demand for urban agriculture products triggered by an annual 2.8 percent urban population growth from rural-urban migration, and internal growth. Livestock products (milk, eggs, broiler meat) also filled the vacuums that the economically ailing parastatals caused during the mid-1980s economic reforms. For example, of the 29 urban agriculturalists interviewed for this study, 21 sold 89 percent of the products obtained daily from their agricultural enterprises. The researcher observed that products were sold to consumers and city institutions (schools, hotels, hospitals, bars, cafeterias, restaurants). In the city, however, the intensity theory and the industrial-urban hypothesis both support the proliferation and intensification of urban agriculture activities. The intensity theory, developed by von Thuenen (Katzman, 1974; Kellerman, 1983), predicted that there is more intensity of supply use in agricultural areas that are closer to market centres. The industrial-urban hypothesis (for instance, Shultz, 1953) holds that the degree of economic organization near the centre of the matrix of economic development offers opportunities that tend to

enhance agricultural production possibilities. In the city for example, "the relatively disproportionate concentration of informal sector activities in the urban areas can possibly be attributed to three major factors" (Bagachwa, 1991, 1-15). First, like large firms, informal sector establishment appears responsive to the existing or emerging urban agglomeration economies. Second, both the government (e.g., Small Industry Development Organization, National Bank of Commerce, and Cooperative Rural Development Bank) and Non governmental Organizations who provide limited support to the informal sector prefer to support urban-based activities because they are easy to reach and monitor and therefore involve lower administrative costs. Third, prospects for alternative employment in rural-based agriculture are much brighter than those for urban-based large scale industry.

The presence of the infrastructure (open spaces, houses, water, roads) in the city also encouraged people to do urban agriculture. There are three types of open spaces in the city. The first type are those that are legally under the jurisdiction of the City Council (parks, playgrounds, unbuilt surveyed areas, river valleys, roadside). The second are open spaces that belongs to the government, public institutions, and private companies, and the third are open spaces in undeveloped plots that belong to individuals. And important too, are houses, water, and roads. In Dar es Salaam, as population growth and urbanization increased, land that was used for agriculture decreased in size (Sawio, 1993). "Land available for crops or livestock in the urban areas is a scarce resource. Very often, it is the amount of land available that even dictates what kind and how many enterprises one can establish" (Mvena et al., 1991, p. 71). Other researchers have reported similar findings (Freeman, 1991; Gbadegesin, 1991; Gefu, 1992; Kleer, 1987; Mbiba, 1994; Memon & Lee-

Smith, 1994). At the end of 1993, data collected for this study showed that of the 18,286 dairy cattle in the region of Dar es Salaam, 9,081 were kept in urban wards, and 86.4 percent were kept in the district of Kinondoni. The reasons were twofold: because these areas have large plots with ample land for grazing, and the wards had a high concentration of elite and bureaucrats. To further underscore this, Mvena et al. (1991) summarized:

Due to high land requirements, most dairy farmers are more likely to be found in the middle and low density areas. These are also areas where the better off class of urban workers/residents reside (p. 50).

### Individual Level Factors

There were four fundamental factors at the individual level that encouraged people to continue urban agriculture. These were economic circumstances, production of food, limited understanding of environmental damage, and the interpretation of the actions of those in authority.

Economic circumstances. As has already been noted, data from this study's respondents showed very clearly their view that economic motivations were the primary ones for doing urban agriculture. The credibility of the respondents' statements is enhanced by the literature reviewed in Chapter 2 and 3.

The economic crises facing Third World countries are construed as a combination of external (e.g., structural adjustment) and internal (e.g., low export earnings) economic forces. Given this scenario, the impact of the economic crises on Third World societies' urbanite incomes was devastating. In Tanzania, many studies show that real urban incomes fell throughout the period from 1977 to 1990. Studies also reveal that the income decline was

most severe among senior officials who could not buy superior goods and services nor maintain their bourgeoisie lifestyles. For example, Sarris and van den Brink (1993), wrote that "the minimum wage, for instance, was T Shs 2,500 per month in 1991, and even top civil servant wages were close to the poverty level" (p. 114). These harsh economic conditions forced most people to resort to informal supplementary income generating activities, of which urban agriculture was one.

Production of food. Besides economic reasons, getting food was also mentioned, but with less vigour, as a reason for people to persist in doing urban agriculture. The 29 agriculturalists interviewed for this study showed to consume 11 percent of the produce in their households, and this appeared too insignificant to the public officials interviewed to mention food as a reason for doing urban agriculture. This finding largely disagrees with studies on urban agriculture in most Third World societies which show that urban agriculture is a preserve of the poor people and that they do it for subsistence purposes. This disagreement is found also in other studies on urban agriculture in Tanzania and Dar es Salaam which consistently show that urban agriculture is practised by the rich and the poor alike, and that it is practised not so much for subsistence as for the lucrative commercial opportunities it offers. Although doing urban agriculture clearly produces food, most agriculturalists interviewed in the present study used the logic that most people with money could buy food items from the city markets.

Limited understanding of environmental damage. This study showed that most

agriculturalists expressed agreement with most statements about the psycho-social, and social-political-legal issues, and those related to accident, and city-landscape. However, on average less than half agreed with statements related to disease-health issues, suggesting that there was a poor understanding of this kind of environmental damage. Furthermore, the study showed that most agriculturalists' based their beliefs about the issues of environmental damage on their personal experience. These results supported the findings of Maxwell & Zziwa (1992) in Kampala, Uganda who found that about 87 percent of the agriculturalists' knowledge was based on their homes. The present study also found that most public officials agreed that most urban agriculturalists were aware of the environmental damage caused by their enterprises although a few officials said that most agriculturalists were not knowledgeable about the scientific or damaging effects of urban agriculture and its impact on public health. These findings partly help to clear up the issue existing among researchers on urban agriculture who think that it should not be condemned for its presumed environmental damage and negative health impact. Literature reviewed in Chapter 3 shows that there are two viewpoints to this controversy. First, there are those who argue that the potential environmental damage and health risk of urban agriculture is insignificant compared with the benefits of its food production. If these views prevail, it would limit an "understanding of the inter relationships between health, environment and urban development . . . and for the development of environmental health programmes . . . and urban environmental management" (Songsore & McGranahan, 1993, p. 10). The second view is that urban agriculture damages the environment, engenders health risks, and ought to be regulated for its environmental sustainability. In Tanzania, especially Dar es Salaam,

it seems clear from the present study that this second view is the more accurate. Urban agriculture is damaging the environment and appears to be beyond most people's understanding. It appears that the government has no environmental education programs for teaching people that they could lessen the damage that urban agriculture caused. For example, results of this study revealed that most people's main basis for beliefs about most issues of environmental damage was their own experience. The study also showed that most agriculturalists were not knowledgeable on issues of damage that related to disease-health issues and their impact on public health. These findings are congruent with Mvena's et al. (1991) and Shauri's (1989) results. The former wrote that in Tanzania urban farmers were using pesticides, herbicides, and even fertilizers, but were unaware of their effects. They added that, while the better educated urban farmers had increased their adoption of innovations, it had been to the detriment of their own environment. As various studies show, this posed a serious problem among urbanites because zoonotic diseases could be imminent in the city. As noted earlier, the agriculture and livestock extension agents who could teach people about the environmental damage that livestock caused, were themselves deficient in environmental education.

Interpretation of the actions of those in authority. Findings of this study also showed that people persisted in doing urban agriculture in spite of its damaging effects because of low and medium income earners' interpretation of the actions of people in authority. The study showed that other agriculturalists of low and medium SES continued their damaging practices in spite of the effects because they saw the government and ruling party elite and

bureaucrats do it without being punished. As already noted, the city elite and bureaucrats were aware of the city bylaws that regulated urban agriculture, but most violated them with impunity. Perusal of the interview data for this study revealed a common voice among people of low and medium SES. They argued that if it was true that livestock caused the environmental damage, why was it that the elite and bureaucrats persisted to do it, and even broke the bylaws they had enacted.

#### Summary of Factors that Explain Persistence

The foregoing discussion shows that explaining the persistence of urban agriculture in spite of its evident damage to the environment is not a simple matter. It involves consideration of socioeconomic and political factors at least at four levels: government, ministry, city council, and individual.

In the interplay of these factors, the individual who is continuing to do urban agriculture is responding not only to his or her own (largely economic) motivation, but also to a web of other factors. Principal among these are a poor economic climate, government policies, which encourage agriculture as a means of coping with declining economic standards (but which leave the regulation of practice to lower levels of government). Another is a system of government status and rewards that enables some people to ignore regulations (and thereby set a standard for more general bylaw contravention). Yet another factor is an agricultural extension service which is not only under-resourced and poorly coordinated, but which also relies on agents who themselves are not well trained and are vulnerable to the temptation of being rewarded for acquiescing in environmentally damaging practice.

The explanations discussed here lead to a number of conclusions, implications and recommendations which need to be considered if the situation in Dar es Salaam is to be improved.

## CONCLUSIONS AND RECOMMENDATIONS

In order for these conclusions to be properly considered, it is important that they be viewed in the light of the limitations attached to the study. Accordingly, the first subsection deals with these limitations. The next one looks at the conclusions of this study, and the last one explains the recommendations for policy and practice which flow from them, and those pertaining to further research.

### Limitations of the Study

There are two basic kinds of limitations in this study, those having to do with the researcher himself, and those having to do with the nature of the group of respondents for the field data.

The fact that the researcher was pursuing the study as a doctoral study, rather than as an agency--funded research project, meant that it had to be carried out within the considerable constraints imposed by the lack of resources--time, money, assistants, transportation. These constraints meant that the number of respondents was relatively small, that officials from the non-public sector were not interviewed, and that only selected areas of the city could

be surveyed. The researcher had held (and was returning to) a position at Sokoine University of Agriculture. It is possible that this affiliation may have led respondents to be less than candid in interviews. In fact, all the indications are that this was not a problem and interviews were characterized by high degree of frankness.

The selection of 29 agriculturalists and 27 public officials was dictated largely by available resources. This group is perhaps a small one from which to generalize. It is also the case that the public officials may have been constrained in their views by the position or the policies of their Ministries or departments. Again, however, these people gave very frank interviews and the researcher had no evidence that the views were being constrained by ministerial or departmental affiliations. Two other aspects of the selection of respondents should also be mentioned. These are, first, that only keepers of livestock were included and, second, that all the 29 agriculturalists were in planned and developed areas of the city. Thus, excluded from the sample were those who grew only crops and those who lived in poorer areas of the city--the many poor people who live in unplanned squatter areas of the city. The first of these limitations was not considered serious because the bulk of environmental damage from urban agriculture comes from the keeping of livestock, not from growing crops. The second limitation means that a somewhat truncated picture of Dar es Salaam's urban agriculturalists has emerged (the education and income levels of most respondents, for example, are relatively high). Nevertheless, this limitation may well be considered a virtue of the study, since few other studies have shown the involvement in urban agriculture of the higher status elements of the population in developing countries.

A number of conclusions can be reached on the basis of this study, and the next

subsection deals with these conclusions.

### Conclusions

The practice of urban agriculture in developing countries is often considered to have four characteristics. First, it is beneficial. Second, it is mostly done by the poor section of the population. Third, most people do it to obtain food. Fourth, it is part of the informal sector as distinct from the formal one. These characteristics do not well apply in Dar es Salaam. Although there are several benefits of urban agriculture, it also causes considerable environmental damage. Urban agriculture in this study was found to be done mainly by wealthy people. It is done more for money than for food, and finally, it has at least some attachment to the formal sector in that it is subject to regulation, and enjoys services that are provided by MALCD.

The issue that needs resolution is first, whether urban agriculture should continue, and second, if it should, how it can be continued without damaging the urban environment.

This study has shown that urban agriculture is here to stay and will continue for two reasons. First, is the continuing economic austerity that is eroding urbanites real income in Tanzania. Second, is the fact that urban agriculture properly practised does have a number of benefits: for nutrition, as an alternative to unemployment, for income generation and poverty reduction, for community well-being, waste management, production of manure, and conversion of food items. The question of whether urban agriculture should continue seems settled: it will; and even if its continuation were in doubt, there are good reasons for

not letting it disappear.

The contribution of this study has been to provide a fuller understanding than before of urban agriculture and its damaging effects. It is on the basis of this understanding that we can address the issue of how it can be continued without environmental damage. Three points are worth considering: (1) urban agriculture cannot be well understood by focusing only on its practitioners, (2) regulation is not working, and (3) education is deficient. Each of these is discussed in the following paragraphs.

There is a need to recognize the interdependence of government, MALCD, City Council, and the individual in issues that pertain to lessening environmental damage that urban agriculture is causing. It is imperative that the role of each party for lessening environmental damage is charted out and that it is recognized that their effects are cumulative in nature. All parties should aim for sustainable urban development that encompasses three major points of view: economic, social, and ecological. As this study showed, the three concepts were not reconciled and effectively operationalized to successfully achieve sustainable urban agriculture. The economic point of view predominates. It has been shown that most agriculturalists were more concerned with the maximum flow of income from their enterprises than they were with the environmental aspects. This is what has been termed as "ecocide" in which most green economists attribute the growth of so-called environmental externalities, such as resource depletion and pollution of market forces. Theoretically, the "tragedy of the commons" (Hardin, 1968) is traced to selfish (albeit economically rational) exploitation of the commons (air, waterways) by private capital for short term private gain (Eckersley, 1993, p. 4). The ecological view, therefore,

of sustainable urban agriculture should focus more on the stability of biosphere and social systems than purely on the economic viewpoint.

Regulation of livestock in Dar es Salaam is not working and there are a number of reasons why this is so. First, many people who practice urban agriculture are senior officials who have impeded efforts to enforce regulation. Change of the social structure and its norms cannot occur overnight, but the government may be able to supplement regulation by using incentives which will help to alleviate the undue and adverse influence of the wealthy in urban agriculture. The government may collaborate with the City Council in using taxation for example. Taxes might be levied on people keeping livestock in the city, and even higher taxes for those keeping more than the allowed four cattle or earning more than a basic amount from urban agriculture. Other taxes might be for those who dispose of animal manure on their compounds.

Motivating individuals to act is often seen as offering the carrot or applying the stick. Regulations constitute the stick. The present study shows that few "carrots" exist which encourage the non-damaging practice of urban agriculture. It should also be noted that both "carrot" and "stick" are external motivations. Little attention has been given to empowering individuals so that they accept responsibility for the consequences of their own urban agriculture and do not simply point to others as doing the damage.

In Dar es Salaam, an educational approach to reducing environmental degradation seems subordinate to a regulatory one. Where education is used, it is deficient. This study has shown that agriculture/livestock extension agents are offering education inequitably, favouring people of higher status. Moreover, this education is inaccurate in that the people

are not taught to cull their animals, to give them adequate feed (e.g., people provide poor feed to exotic crossbreeds), and to test them for zoonotic diseases. The education that agents offer is also inadequate in that it emphasizes yield maximization rather than the means of lessening environmental damage. This study uncovered serious problems in this area. Extension agents working in the city are inadequately trained in the very subjects they offer information on. There is a lack of supervision by district extension officers of the extension corps. MALCD appears not bothered by the fact that most extension agents do not find their clients in their homes, because agents have same working hours as their clients.

On the basis of the above conclusions we move to make a number of recommendations.

### Recommendations

The recommendations for this concern both policy and practice and further research. The recommendations for policy and practice are arranged in the sequence of the conclusions discussed above. Each recommendation is numbered and followed by an explanation.

Recommendations for policy and practice. Ten recommendations are advanced for policy and practice.

*Recommendation 1. That the government should formulate an Urban Agriculture Policy, clearly spelling out the respective roles of the Government, the*

*Ministry of Agriculture, Livestock and Cooperative Development, and City Councils.*

Tanzania already has well established national policies for "normal" agriculture, that is to say for agriculture carried out in rural areas. The National Agriculture Policy of 1982 and the Livestock Policy of 1983 seem to work well, but do not deal with many of the kinds of issues which arise, as this study has shown, in urban agriculture. A national urban agriculture policy would both recognize the importance of urban agriculture and encourage it, while at the same time ensuring that its dangers and limits were known. The focus of the policy should be on sustainable urban agriculture. The policy should specify the roles of different levels of government and agencies in creating, promulgating and enforcing regulations to govern urban agriculture. This study has shown, and this is supported by literature and studies on urban agriculture, that the government cannot leave the City Council to "fight the unconquered battle" of enforcing its bylaws alone.

*Recommendation 2. That all levels of government pledge to enhance coordination with respect to urban agriculture among various government Ministries, departments, institutions, agencies and individuals.*

Planning and management of cities like Dar es Salaam requires a coordinated and participatory approach to addressing the issues which confront a society, i.e., economic, social, political and environmental (Halla, 1994, p. 19). In 1992, for example, in the city, the

United Nations Centre for Human Settlements (Habitat) started a project called "Sustainable Dar es Salaam Project." Policy-makers could use this chance to heighten coordination and promote the participation of agriculturalists, MALCD, the City Council, and the city's community (i.e., popular, private, public) to lessen environmental damage. Such a policy would ensure that urban agriculture is carried out sustainably because the people would know its public health impacts and they would cooperate to lessen its problems. This would help to expel the notion, as this study found, that most agriculturalists thought that environmental damage was caused by "the other" people in other areas.

*Recommendation 3. Planners should re-examine urban planning concepts with a view to incorporating urban agriculture in urban planning and thereby minimizing the environmental problems that accompany it.*

The trend in urban planning and management of Dar es Salaam is to move toward high density plot sizes because of the ease this affords in managing the city's services. It also makes sense for urban economics, especially when urban agriculture is not included in the equation. However, the results of this study and the model in Figure 2 challenge this view because as other studies also show, urbanites say that urban agriculture should be protected and it is almost certain to increase. Also, it has been shown that as the economies of most Third World societies are dwindling, urban agriculture is becoming an integral part of the urban economy. The incorporation of urban agriculture in appropriate ways into urban planning would help to reduce the ad hoc and unregulated use of land and facilitate

regulation of agricultural practices.

*Recommendation 4. The government should formulate a policy for developing peri-urban areas for urban agriculturalists to move their activities to.*

The funding for such projects could be met jointly by the national banks and the government. Findings of this study also showed that most urban agriculturalists interviewed had farms in the peri-urban areas. They were willing to move their urban agriculture activities if the government developed and improved the services such as roads, water, electricity, telephone, and security. In the mid 1980s, for example, regional commissioners in the cities of Dodoma and Morogoro formulated policies that would have eventually moved urban agriculture activities out of their cities. The policies included planning and developing land from one to five hectares that was given to willing urbanites to farm. These areas were provided with services, but as of the early 1990s, these efforts had collapsed, mainly due to a change of leadership and lack of funds. In the city, this example could provide a worthwhile experience from which policy-makers and urban planners could learn.

*Recommendation 5. Consideration should be given to the development of policies that promote the development of non agricultural small businesses such as transportation, manufacturing, retailing and hotel management.*

Findings of this study are consistent with the literature on urban agriculture in Tanzania

showing that people did it because of the economic hardships that the country endured. The aim of the policy recommendation here should be to dissuade people from doing urban agriculture that damages the environment. Some respondents told the researcher that some urbanites had quit practising urban agriculture after they had "discovered" other lucrative non agricultural enterprises. Under this policy, the lending national banks would be encouraged to loan money to individuals with sensible alternative proposals after proving that they had removed any livestock keeping activities from their premises. This could easily be monitored because the main lending banks such as the National Bank of Commerce and the Cooperative and Rural Development Bank have agricultural-trained personnel who supervise agricultural-oriented credits.

*Recommendation 6. The taxation system should be reviewed to see whether new or redesigned taxes on urban agricultural earnings or practices might serve as incentives for more sustainable practice.*

Policies for taxing those keeping livestock in the city are already in place, but they tend to be ineffective for reasons similar to those resulting in lax bylaw enforcement. This sixth recommendation suggests that an alternative to the pursuit of tax evasion is the use of taxes as an incentive to better the practice. It may also need to be accompanied by better enforcement of existing tax regulations.

*Recommendation 7. The Government and MALCD should formulate a clear*

*and firm policy for education of both the general public and urban agriculturalists in matters of environmental damage.*

The role of education in lessening environmental damage resulting from urban agriculture need to be enhanced and it cannot be overemphasized. The role of MALCD agents in such education should be clarified. The education of the agents themselves should include some knowledge of urban sociology and the agency should ensure that all agents are properly knowledgeable about not only agricultural practice, but also the environmental damage that can be caused.

*Recommendation 8. There should be a coordinated sharing of educational and bylaw enforcement duties of the two departments presently involved (City Council and MALCD).*

In the city, if urban agriculture is to continue sustainably, policies that purport to educate agriculturalists must be adhered to in order for the people to understand its advantages and the impact on public health to nearby residents.

*Recommendation 9. MALCD should improve the coordination of its extension agents and review the hours of work of those involved in city areas so that agents can be available when clients are able to see them.*

All these features of the MALCD extension operations were seen to be problematic and need to be reviewed for improved service.

*Recommendation 10. Bylaw enforcement should be insisted upon and should be managed not by the City Council alone, but by both City Council and MALCD.*

The present laxity of bylaw enforcement not only encourages poor practice, it also brings regulation into dispute. It results in part from the city having inadequate resources for enforcement. The recommendation here would capitalize on the authoritative knowledge of MALCD agents in bringing some credibility to bylaws enforcement. The urban agriculture policy (Recommendation No. 1) could instruct MALCD through its agents not to sell livestock or advise urbanites found keeping livestock in government houses. It could also recommend that urbanites keep only four cattle. MALCD agents would also decline giving animal permits to people who did not have animal sheds built to MALCD specifications. Also they would refuse to advise livestock keepers found damaging the environment in anyway; for example, by having animal dung in the compound, keeping more than four animals, or not practising zero-grazing. Bylaw enforcement would then complement efforts made by other government ministries to enforce regulations, for example, those that forbid tenants from keeping livestock in government houses.

Recommendations for research. Four recommendations are made for further research.

*Recommendation 11. That studies on urban agriculture should be coordinated and involve all relevant experts.*

There is little evidence of a coordinated research agenda examining urban agriculture. Coordination might be arranged through one of the higher learning institutions such as Sokoine University of Agriculture or the University of Dar es Salaam. MALCD should also take a keen interest and help researchers in various ways to further understand urban agriculture practices and how its damaging effects can be lessened.

*Recommendation 12. Any future research on urban agriculture should include the poor section of the population in the squatter areas of the city.*

The present study has no representation from poorer areas of the city. While this has led to interesting findings about urban agriculture in wealthier areas, it has provided no data to compare with other studies which have examined poorer areas elsewhere (e.g., in Addis Ababa, Ethiopia by Egziabher, 1994; in Nairobi, Kenya by Freeman, 1991; in Lusaka, Zambia by Rakodi, 1988a).

*Recommendation 13. Action research should be initiated to monitor the progress of new policy recommendation and chart alternative course of action.*

This would ensure that the policy urged in Recommendation No. 1 has a built in

evaluation component. The use of action research would add to more traditional research approaches and would also have the potential to assist in empowering people to be responsible for their own practice.

*Recommendation 14. Adult education research should be initiated to determine how best to use education as a tool in lessening environmental damage caused by urban agriculture.*

Although Tanzania has been hailed in the past for reducing the illiteracy rate, but little is known about the adult education methods, processes and approaches for educating urbanites who are doing urban agriculture. Not only is this important, but also to look into aspects of adult education that could work effectively for reducing environmental damage that urban agriculture causes.

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**APPENDICES**



APPENDIX 2

CHUO KIKUU CHA SOKOINE CHA KILIMO  
OFISI YA MAKAMU WA MKUU WA CHUO

S.L.P. 3000, MOROGORO, TANZANIA

Simu: 4651 4523 TELEX NO 55308 UNIVMOG TZ TELEGRAMS "UNIAGRIC" MOROGORO

Kumb. zetu ~~SUA/ADM/R.1/V.1/8/XII~~ Kumb. zako ..... Tarehe: 1 Julai, 1993

.....Mkurugenzi wa Maendeleo (M).....

.....P.O. Box.....

.....DAR ES SALAAM.....

UTAFITI WA WAALIMU NA WANAFUNZI WA CHUO KIKUU

Madhumuni ya barua hii ni ~~kuwambulisha~~ / kumtambulisha

Kwako: .....MALONGO R. S. MLOZI.....

~~ambao~~ ambaye ni ~~wakati~~ mtafiti wa Chuo Kikuu Cha Sokoine Cha Kilimo. ~~Kwa~~ huyo hivi sasa ~~wako~~ /yuko katika shughuli za utafiti.

Kufuatana na Waraka wa Serikali Kumb. Na. MPEC/R. 10.1 wa tarehe 7 Julai 1980 na Kifungu Na. 8 cha Sheria Namba 6 ya 1984 (ya kuanzisha Chuo), Makamu wa Mkuu wa Chuo alipewa madaraka ya kutoa vibali vya kufanya utafiti nchini kwa Walimu. Wanafunzi na Watafiti wake kwa niaba ya Serikali na Tume ya Sayansi na Teknolojia.

Hivyo basi tunaomba ~~wanapate~~ umpatie ~~Wataalamu~~ /Mtaalamu ~~walipotajwa~~ / aliyetajwa hapo juu ~~msaada~~ /msaada atakaohitaji ~~watakuhita~~ ili uchunguzi ~~wao~~ /wake uweze kufanikiwa. Gharama za malazi na chakula ~~nao~~ chake pamoja na usafiri wao/wake ~~watalipia~~ /atalipia ~~wenyewe~~ /mwenyewe kutokana na fecha walizopewa Chuo Kikuu. Msaada ~~wanaohitaji~~ /anaohitaji zaidi ni kuruhusiwa kuonana na viongozi na wananchi ili ~~wawezesha~~ /weze kuzungumza nao na kuwauliza maswali ~~walio~~ /aliyo nayo.

Kiini cha Utafiti wa ~~Wataalamu~~ /Mtaalamu ~~walipotajwa~~ / aliyetajwa hapo juu ni:

.....KILIMO CHA MSINI:.....UHARIBIFU UNAOLETWA KWA MAZINGIRIA.....

Sehemu ~~wanayotawa~~ /anazofanyi a huo utafiti ni:.....MKOA WA DAR ES SALAAM.....

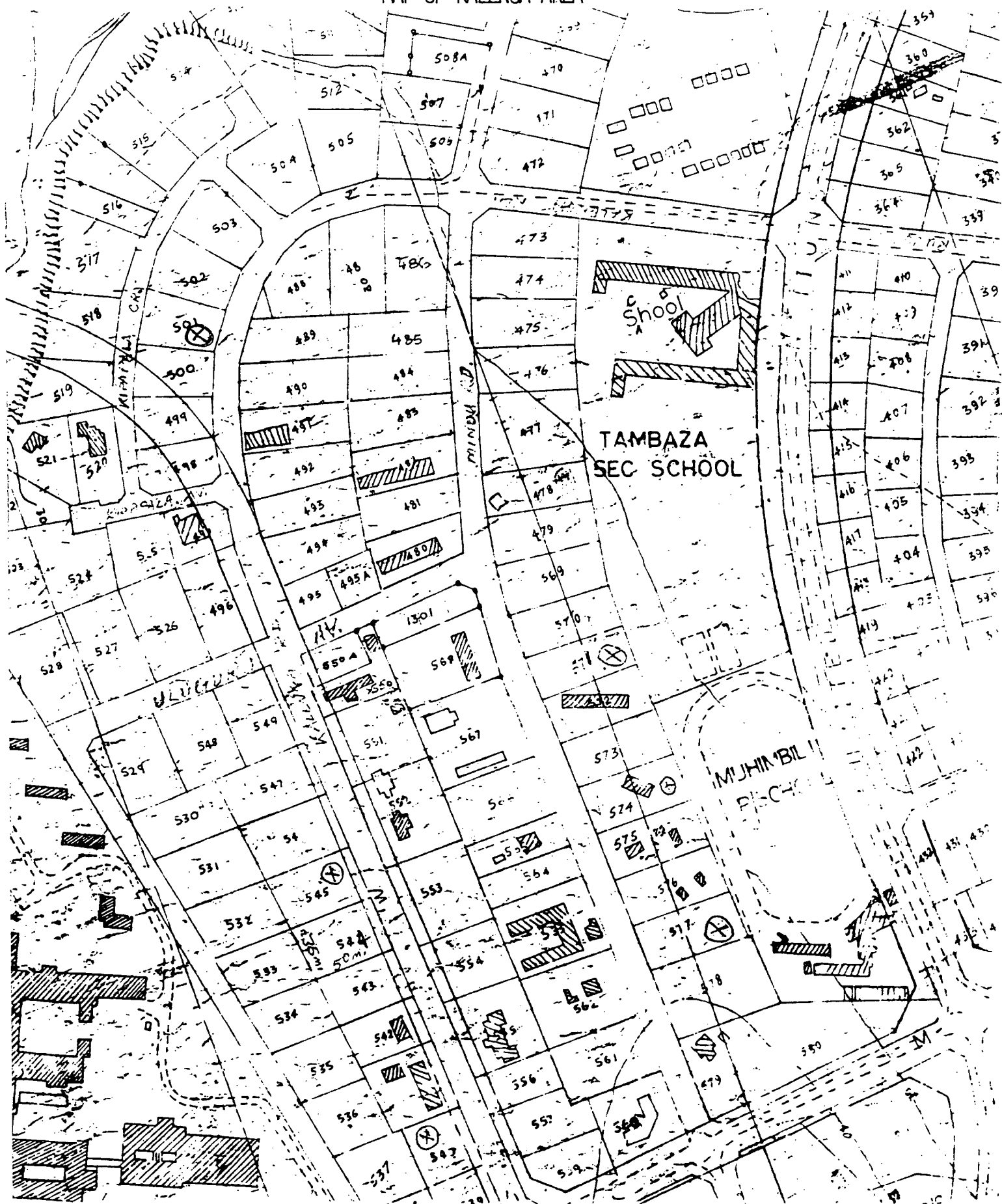
Ikiwa kuna baadhi ya sehemu ambazo zinazuilika, ni wajibu wako kuzuia zisitembelewe.

Muda wa Utafiti huo ni kuanzia tarehe:.....JULAI, 1, 1993.....hadi.....SEPTEMBER 30, 1993

Ikiwa utahitaji maelezo zaidi wasiliana na Makamu wa Mkuu wa Chuo.

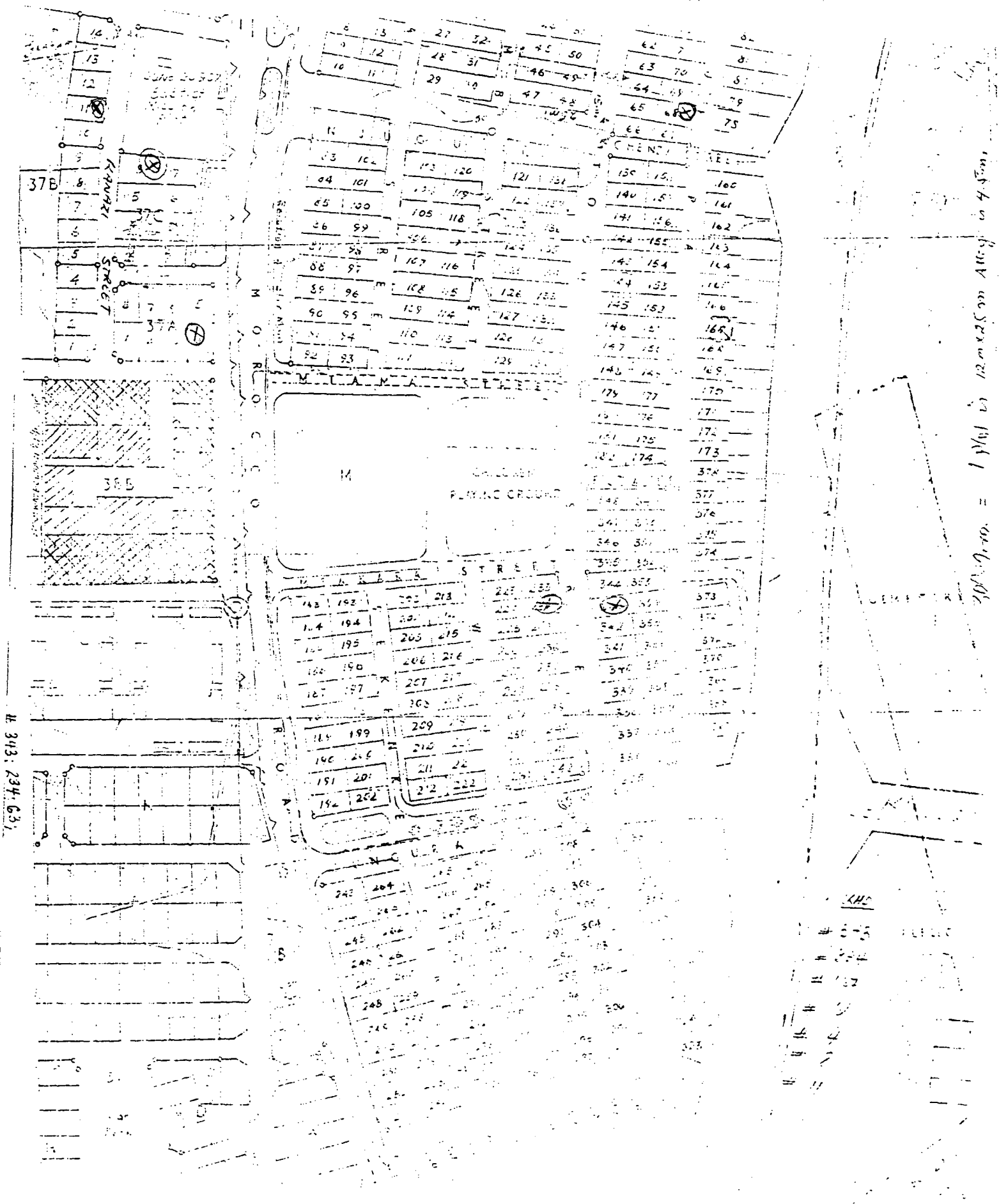
Prof. A. G. Lwoga  
MAKAMU WA MKUU WA CHUO

MAP OF KALENGA AREA

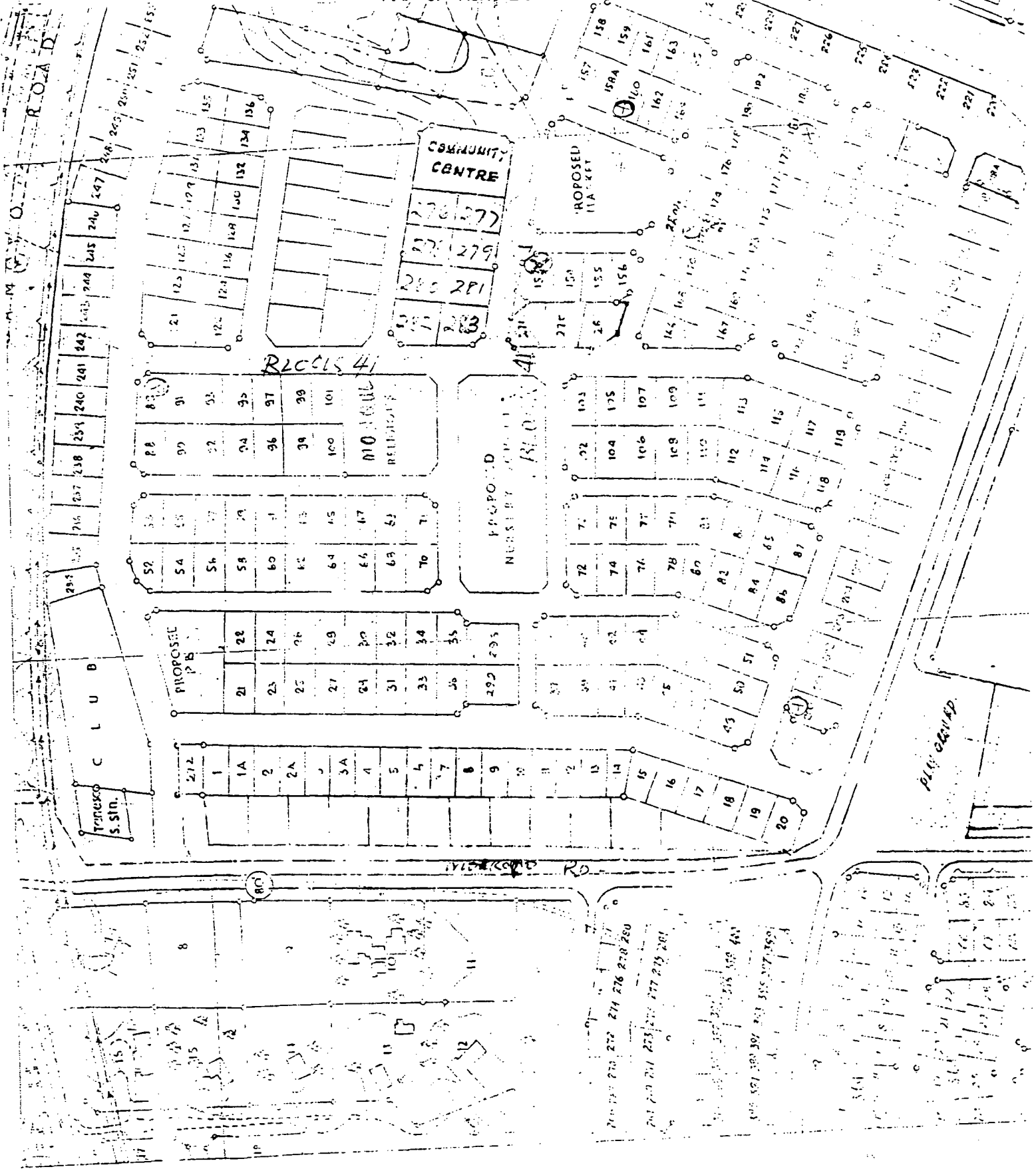


262  
MAP OF KINONDONI BLOCK A

APPENDIX 5



MAP OF KINONDONI BLOCK 41



172,  
89  
1111

MAP OF SHABANI ROBERT AREA



MAP OF OYSTERBAY AREA



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**NDONDOO INAYOHUSU HALI YA MTAINIWA ANAYEFUGA WANYAMA NA KUOTESHA MIMEA  
KATIKA MJI WA DAR ES SALAAM**

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**INTERVIEW SCHEDULE OF SOCIO-DEMOGRAPHIC CHARACTERISTICS OF URBAN  
AGRICULTURALIST IN DAR ES SALAAM, TANZANIA**

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**MKATABA WA TAARIFA**

Jina langu naitwa Malongo R.S. Mlozi, ninafundisha Chuo Kikuu cha Sokoine cha Kilimo kilichopo Morogoro. Sasa hivi nachukua masomo ya juu huko Chuo Kikuu cha British Columbia, Vancouver, Canada. Utafiti huu unahusu namna kilimo cha mjini kinavyoharibu mazingira ya mji wa Dar es Salaam. Nitakuuliza taarifa za aina mbili. Aina moja ni kuhusu taarifa zinazokuhusu wewe, familia yako na shughuli zinazohusu uharibifu wa mazingira ya mji unaoletwa na kulima mjini Dar es Salaam. Sihitaji kujua jina lako na taarifa utakazozitoa ni siri. Utafiti huu hauhusiki kwa namna ye yote ile katika kuzuia kilimo cha mjini. Nitakapoandika thesis yangu sitatumia jina lako pahala popote. Na wala sitatoa taarifa hizi kwa wanasiasa, mao-ofisa wa serikali, kwa halmashauri ya jiji au kwa mtu ye yote. Taarifa hizi zitatumika kuandika thesis yangu tu. Unaweza kuacha kuzungumza nami wakati wa mazungumzo haya. Baada ya kuandika thesis taarifa zitakazokuwemo kwenye tape na kwenye ndondoo zitaharibiwa. Je! una maswali ye yote?

---

**CONTRACT SETTING**

My name is Malongo R.S. Mlozi, a Lecturer at Sokoine University of Agriculture, Morogoro. Currently I am doing a doctoral degree at the University of British Columbia, Vancouver in Canada. This study is about urban agriculture in the city of Dar es Salaam. I will be asking you to give two types of information. One type is to do with socio-demographic characteristics and the other is to do with information pertaining to causes of environmental damage of urban agriculture (animal and crops) in the city of Dar es Salaam. I do not require your name and the information you provide is confidential. This study is not part of any attempt to limit urban agriculture. When I write my thesis I will not use your name. Nor will I be giving this information to the politicians and bureaucrats, the city authorities or anyone else. It will only be used in my thesis. You may stop talking to me at any time. After I have written the thesis the tapes and notes will be destroyed. Do you have any questions ?

---

Mwanamume

Male

Mwanamke

Female

**TAFADHALI, TOA TAARIFA KUHUSU MAMBO YAFUATAYO:**

Please, give information about the following:

**(1) Ulizaliwa katika mkoa na wilaya zipi?**

In which region and district were you born?

Mkoa

Region

Wilaya

District

**(2) Je! ulikulia katika mazingira yapi? Mazingira ya kijijini**

In which area did you grow up?

Rural area (outside the city boundary) Mazingira ya mjini   
Urban area (within the city boundary)**(3) Ni muda gani umeishi mjini Dar es Salaam?**

How long have you lived in Dar es Salaam city?

miaka

\_\_\_\_\_ years

**(4) Je! katika kila mwaka uliyotajwa hapo chini umeishi sehemu zipi (taja angalau sehemu tatu kwa mwaka)?**

Where did you live in the following years (at least three places per year)?

1992

1991

1990

1989

1988

1987

(5) Je! wewe kabila lako ni lipi?

What is your tribe?

(6) Je! umewahi kuishi kwenye shamba?

Hapana  H

Ndiyo  S -----> Muda gani? \_\_\_ miezi; \_\_\_ miaka; \_\_\_ lini

Have you lived in a farm? N

Y -----> How long? \_\_\_ months; \_\_\_ years, \_\_\_ when

(7) Je! umefanya kazi kwenye shamba?

Kwa mshahara  H

S -----> Muda gani? \_\_\_ miezi; \_\_\_ miaka lini \_\_\_

Kama kazi za nyumbani  H

S -----> Muda gani? \_\_\_ miezi; \_\_\_ miaka lini \_\_\_

Have you worked in a farm?

For wages

N Y -----> How long? \_\_\_ months; \_\_\_ years

when \_\_\_

As family chores

N Y -----> How long? \_\_\_ months; \_\_\_ years

when \_\_\_

**(8) Mpaka leo hii una wanyama wagapi hapa mjini?**

As. of today how many animals do you have here?

	No. of animals	Yield/day (where applic.)	Home consumed		For sale	
			<input type="checkbox"/> H N	<input type="checkbox"/> S Y	<input type="checkbox"/> H N	<input type="checkbox"/> S Y
Ng'ombe wa maziwa: Dairy cows:						
Ng'ombe wanaokamuliwa Milking cows						
Dume la kuzalisha Bulls						
Ndama wa mwaka mmoja Yearlings						
Ndama chini ya mmoja Calves (less than a year)						
Kuku: Chickens:						
Kuku wa mayai Layers						
Kuku wa nyama Broilers						
Kuku wa kienyeji Local fowls						
Nguruwe: Pigs:						
Majike ya kuzalisha Breeding sows						
Dume la kuzalisha Boars						
Nguruwe wa nyama Porkers						
Wengineo Others						

## (9) Je! unalima mboga zo zote?

Do you grow vegetables?

 H N S Y

Aina ya mboga unazolima Vegetables grown	Hectari zilizolimwa Hectares grown	Kiasi ktk kgs./mwezi How many kgs./month	Je! huliwa nyumbani? House consumed		Je! huuzwa? For sale	
			<input type="checkbox"/> H N	<input type="checkbox"/> S Y	<input type="checkbox"/> H N	<input type="checkbox"/> S Y
Mchicha						
Cabegi Cabbages						
Nyanya Tomatoes						
Bilinganya Eggplants						
Pipipili hoho Green pepper						
Bamia Okra						
Jumla ya he. Total ha.						

## (10) Je! unalima mazao ye yote?

Do you grow field crops?

 H  
N S  
Y

Mazao yalimwayo Crops grown	Hekari ulizo- lima Hectare grown	Mapato /mwaka Yield /year	Je! huliwa nyumbani Home consumed		Je! huuzwa For sale	
			<input type="checkbox"/> H N	<input type="checkbox"/> S Y	<input type="checkbox"/> H N	<input type="checkbox"/> S Y
Mahindi Maize						
Mihogo Cassava						
Miti ya minazi Coconut palm trees						
Minanasi Pineapples						
Miti ya michungwa Citrus trees						
Migomba ya kupika Plantain bananas						
Migomba ya kuivisha Fruit bananas						
Mikunde Pulses						
Viazi vitamu Sweet potatoes						
Other crops						
Jumla ya he. Total ha.						

**(11) Ni mradi upi unapendelea zaidi?**

Which type of project do you prefer most?

Unaohusiana na ufugaji mifugo

H

S

Animal-related

N

Y

Unoahusiana kilima mazao

H

S

Crop-related

N

Y

**(12) Je! unaajili vibarua katika miradi yako ya kilimo?**

Do you employ labour in your agriculture projects?

H

N

S

Y



**(13) Kama ndiyo, unawapata vibarua hao kutoka wapi?**

If YES, from where do you get people who work in your agricultural projects?


## SEHEMU YA PILI

SECOND SET

(14) Je! unaishi na ndugu waliotajwa hapo chini? Kama ndivyo, wanafanya nini?

Do you live with the people mentioned below? If so, what do they do?

	Wangapi					Mapato
	Number	Work for Own/comp. or office	Actual job	Attend. school	Help in agric.	Income
<b>Mtahiniwa</b> Interviewee						
<b>Mke/Mume</b> Spouse						
<b>Binti yake</b> Own daughter						
<b>Mvulana wake</b> Own Son						
<b>Mama mzazi</b> Mother						

<b>Baba mzazi</b> Father						
<b>Kaka</b> Brothers						
<b>Dada</b> Sisters						
<b>Wengineo</b> Others						



(15) Je! nyumba unayoishi ni ya nani?

To whom does the house you live in belong?

(16) Je! una vitu vifuatavyo?

Do you own any of the following?

	<input type="checkbox"/> H		<input type="checkbox"/> S	Bought/Dev. by a loan	
	N		Y	<input type="checkbox"/> H N	<input type="checkbox"/> S Y
Radio A radio					
Baiskeli A bicycle					
Shamba nje ya Dar A farm outside Dar					
Uwanja wa kujenga Dar A building plot in Dar					
TV au Video A TV/Video Cassette					
Pikipiki A motorcycle					
Nyumba nje ya Dar A house outside Dar					
Nyumba ya kisasa Dar A "modern" house in Dar					
Gari ya pick-up A pick-up truck (one to three tons)					
Gari ndogo A saloon car					

(17) Kama unao usafiri wako, je! unawabeba watu walio na taarifa au elimu kuhusu kilimo?

If you own transport, do you give lifts to people who have information about urban agriculture?

H

N

S

Y



(18) Kama ndiyo, watu hao ni baadhi ya:

If yes, do these people include:

Bibi/bwana shamba  
Extension workers

H

N

H

Y

Marafiki  
Friends

H

N

S

Y

Majirani  
Neighbours

H

N

S

Y

Baadhi ya wana-familia  
Family members

H

N

S

Y

Mengineo, wataje  
Others specify




(19) Je unatumia gari la ofisi yako kwa usafiri?

Are you provided with an official vehicle?

HAPANA

NO

NDIYO

YES



(20) Je! unalitumia gari hilo kutoa usafiri kuwabeba watu walije na taarifa au elimu ya kilimo?

Do you use it to give lifts to people with information about urban agriculture? N Y

(21) Kama ndiyo, watu hao ni baadhi ya:

If yes, do these people include:

Bibi/bwana shamba Extension workers	<input checked="" type="checkbox"/> N	<input checked="" type="checkbox"/> Y
Marafiki Friends	<input checked="" type="checkbox"/> N	<input checked="" type="checkbox"/> Y
Majirani Neighbours	<input checked="" type="checkbox"/> N	<input checked="" type="checkbox"/> Y
Baadhi ya wana-familia Family members	<input checked="" type="checkbox"/> N	<input checked="" type="checkbox"/> Y
Wengineo, wataje Others specify	<input type="text"/>	<input type="text"/>

(22) Je! ni kiwango gani cha masomo ulichofikia?

What is your highest level of formal education (for High SES)?

Did you attend any formal schooling reach? ( for people in low SES).  N  Y -----> If yes, at what level did you

Shahada ya juu ya chuo kikuu (kama M.Sc., M.A., au Ph.D.) Post-graduate education (e.g. M.Sc., M.A., or Ph.D.)	<input type="checkbox"/>
Shahada ya chuo kikuu (kama B.Sc., B.A., LL.B., n.k.) University education level (B.Sc., B.A. LL.B., etc.)	<input type="checkbox"/>
Stashahada ya chuo au inayolingana College Diploma training or its equivalent	<input type="checkbox"/>
Cheti cha sekondari cha kidato cha sita (kidato cha 6) Advanced secondary school education level (Form 6)	<input type="checkbox"/>
Cheti cha sekondari cha kidato cha nne (kidato cha 4) Ordinary secondary school education level (Form 4)	<input type="checkbox"/>
Cheti kwa kumaliza elimu ya msingi Primary school education level	<input type="checkbox"/>
Cheti kwa kumaliza masomo ya watu wazima Certificate for attending adult education classes	<input type="checkbox"/>
Sina elimu niliyopata kwa kufundishwa darasani No formal education	<input type="checkbox"/>

## (23) Je! ni mafunzo yapi ya juu kuhusu kilimo/ufugaji uliyopata?

What is the highest agriculture training have you received?

Nina shahada ya kilimo kutoka chuo kikuu  
Has a degree from an agricultural university

Nina stashahada ya mazao kutoka chuo cha kilimo  
Has a certificate from an agricultural training institute

Nina stashahada ya mifugo kutoka chuo cha kilimo  
Has a certificate from a livestock training institute

Nilihudhuria sekondari ambayo ni mchepuo wa kilimo  
Attended an agricultural secondary school

N

 H S

----&gt; Muda gani? --&gt; miaka \_\_\_

Y ----&gt; How long? --- months; \_\_\_ year(s)

Nilihudhuria mafunzo ya kilimo kwenye chuo cha wakulima  
Attended a Farmer Training College (FTC)

 N H

S ----&gt; Muda gani? ----&gt; miaka \_\_\_

Y ----&gt; How long? \_\_\_ months; \_\_\_ year

Sijahudhuria mafunzo ya aina ye yote ya kilimo  
None of the above

## (24) Una umri gani?

What is your age?

miaka  
years

## (25) Je! nitajie kiasi cha mapato kwa mwaka ya ndugu umnaoishi nao waliotajwa katika swali nambari 14 hapo juu?

What is the income of relatives you live with mentioned in question 14 above?

**B: MAKUNDI YA MATATIZO - YANAYOHUSIANA NA WANYAMA  
DOMAIN OF CONCERN - ANIMAL RELATED**

**MAMBO YANAYOHUSIANA NA USUMBUFU WA JAMII  
PSYCHO-SOCIAL ISSUES**

Taarifa/matokeo:

Information/consequences:

1. **Watu wengine husema kwamba wanyama hutisha watoto? Wengine wanasema hilo sio tatizo? Je! wewe unafikiria vipi?**

Some people say that animals scare children. Some say this is not a problem. What do you think?

2. **Watu wengine husema wanyama huwakosesha raha na kuwasumbua wakaaji wa mjini? Wengine hukataa na usemi huo. Je! wewe unafikiria nini kuhusu jambo hili?**

Some people say that animals disturb urbanites, and others disagree. What do you think?

3. **Watu wengine husema kwamba kufuga nguruwe sehemu wanazoishi Waisilamu sio jambo zuri. Wengine kawakubaliani na usemi huo. Wewe unafikiria nini kuhusu jambo hili?**

Some people say that keeping pigs in areas inhabited by Muslims is not ideal. Others disagree with those claims. What do you think?

4. **Watu wengine hulalamika kuhusu kelele, harufu, kunuka kunakoletwa na ufugaji wa wanyama. Wengine wanafikiria hizo sio sababu muhimu. Je! wewe unafikiria nini kuhusu malalamiko hayo?**

Some people complain about noises and odours that animals cause. Others think that is not so. What do you think?

[After a reasonable discussion of these areas the interviewer shifts to reasons for not stopping the activities that the interviewee clearly knows about]

Sababu za kuendelea:Reasons for continuation:

1. **Kwa nini watu wanafuga wanyama wanaowatisha watoto?**  
Why do people keep animals that scare children?
2. **Kwa nini watu wafuga wanyama ambao huwasumbua na kuwakosesha raha wakaaji wa mjini?**  
Why do people keep animals that disturb other urbanites? ☉
3. **Kwa nini watu wanafuga nguruwe sehemu wanazoishi Waisilamu?**  
Why do people keep pigs in areas inhabited by Muslims?
4. **Kwa nini watu wanafuga wanyama ambao huleta kelele, harufu, na kufanya mazingira yanuke?**  
Why do people keep animals that cause noises and odours?

**MAMBO YANAYOHUSIANA NA JAMII-SIASA-SHERIA**  
**SOCIAL-POLITICAL-LEGAL ISSUES**

Taarifa/matokeo:Information/consequences:

1. **Baadhi ya wananchi hudai kwamba baadhi ya wenye mifugo hutumia muda wa kufanya kazi maofisini kuangalia mifugo yao. Wengine hupinga madai hayo. Je! wewe unafikiria nini juu ya madai haya?**  
Some citizens claim that animal owners use "official" time to look after their animals. Others dispute this claim. What do you think?
2. **Baadhi ya wananchi husema kwamba kuendelea kwa shughuli za kilimo cha mjini sio kwamba sheria ndogo zilizowekwa hazifuatwi na kuzingatiwa. Wengine wanakata na madai hayo. Je! wewe unafikiria nini kuhusu jambo hilo?**  
Some citizens say that urban agriculture persists not because by-laws are not

enforced. Others disagree with this claim. What do you think?

3. **Waniasia wengine wamelaani kilimo cha mjini. Wengine wanafikiri kwamba kilimo cha mjini hakileti matatizo ye yote mjini. Je! wewe unafikiria nini kuhusu jambo hilo?**

Some politicians have condemned urban agriculture. Others think it poses no problems. What do you think?

Sababu za kuendelea:

Reasons for continuation:

1. **Kwa nini watu wanafuga wanyama ambao huwachukilia muda wa kazi za maofisini kwa kuingalia mifugi hiyo?**

Why do people keep animals when they have to take official time to look after them?

2. **Kwa nini Halmashauri ya Jiji la Dar es Salaam haihakikishi kwamba sheria ndogo za kuzuia kilimo cha mjini zinafuatwa?**

Why doesn't the City Council enforce its bylaws that regulate the doing of urban agriculture?

3. **Kwa nini watu wanaendelea na kilimo cha mjini wakati baadhi ya Waniasia wanakilaani?**

Why do people continue their urban agriculture enterprises when some politicians condemn them?

## **MAMBO YANAYOHUSU MAGONJWA NA AFYA DISEASE-HEALTH ISSUES**

Taarifa/matokeo:

Information/consequences:

1. **Watu wengine wanafikiria kwamba kinyesi cha wanyama mjini sio kitu kizuri kiafya. Wengine hawakubaliani na dai hilo. Je! wewe unafikiria nini kuhusu dai hilo?**

Some people think that animal dung in the city is unhealthy. Others disagree. What do you think?

2. **Watu wanawalalamikia wanyama mjini kwa ongezeko la ugonjwa wa malaria. Wengine wanasema hilo silio tatizo. Je! wewe unafikiria nini kuhusu dai hilo?**

Some people blame animals for the increase of malaria in the city. Some say this is not a problem. What is your opinion?

3. **Watu wengine hudai kwamba kinyesi cha wanyama huchafua maji ya chini ya ardhini. Wengine hawakubaliani na dai hilo. Je! wewe unafikiria nini kuhusu dai hilo?**

Some people claim that animals cause pollution of ground water. Others disagree. What do you think?

4. **Watu wengine wanadai kwamba wanyama wanaweza kueneza kwa binadamu magonjwa kama ya kimeta, kutupa mimba na kifua kikuu. Wengine wanasema hilo sio tatizo. Je! wewe unafikiria nini kuhusu dai hilo?**

Some people claim that animals can transmit diseases to humans diseases such as anthrax, brucellosis and tuberculosis. Others say this is not a problem. What do you think?

Sababu za kuendelea:

Reasons for continuation:

1. **Kwa nini watu wanafuga wanyama mjini ambao hutoa kinyesi ambacho huleta madhara kiafya?**

Why do people keep animals that produce dung, which people think is unhealthy in the city?

2. **Kwa nini watu wanafuga wanyama mjini ambao watu wanasema huleta ongezeko la maradhi ya ugonjwa wa malaria?**

Why do people keep animals that some say that they cause malaria in the city?

3. **Kwa nini watu wanafuga wanyama mjini ambao watu wanasema kinyesi chao**

**kinachafua maji ya chini ya aridhini?**

Why do people keep animals that some say that the pollute the ground water?

4. **Kwa nini watu wanafuga wanyama mjini ambao watu wengine wanasema wanaeneza kwa watu magonjwa kama ya kimeta, Brucelosis, na kifua kikuu?**

Why do people keep animals when some people say that they can transmit to humans diseases such as anthrax, brucellosis and tuberculosis?

**MAMBO YANAYOHUSU AJALI  
ACCIDENT ISSUES**

Taarifa/matokeo:

Information/consequences:

1. **Watu wengine wanadai kwamba wanyama wafugwao mjini husababisha msongamano wa magari na wenda kwa miguu, ambao wakati mwingine husababisha ajali. Wengine wanasema madai hayo sio kweli. Je! wewe unafikiria nini kuhusu madai hayo?**

Some people claim that animals in the city cause traffic jams that sometime lead to accidents. Some say this is not so. What do you think?

2. **Wanachi wengine wanadai kwamba wanyama hujisugua kwenye nguzo za umeme na kuzifanya zianguke chini ambako umeme unaweza kuwapa wata mshituko. Wengine kawakubaliani na madai hayo. Je! wewe unafikiria nini kuhusu madai hayo?**

Some citizens claim that animals can rub themselves on electricity poles, and make them fall down where humans can be electrically be shocked. Others disagree with this claim. What do you think?

3. **Watu wengine hudai kwamba wakati mwingine wanyama wanaweza kuwaumiza watu kimwili. Wengine hawakubaliani na madai hayo. Je! wewe unafikiria nini kuhusu madai hayo?**

Some people claim that animals can cause bodily harm to humans. Others disagree. What do you think?

4. **Watu wengine hudai kwamba wanyama wanaweza kuwaumiza wenda kwa**

**miguu, watoto, wazee na wagonjwa. Wengine hawakubaliani na madai hayo. Je! wewe unafikiria nini kuhusu madai hayo?**

Some people claim that animals sometimes hurt pedestrians, children, old and sick people. Others disagree. What do you think?

Sababu za kuendelea:

Reasons for continuation:

1. **Kwa nini watu wanafuga wanyama ambao husababisha msongamano wa magari na wakati mwingine husababisha ajali barabarani?**

Why do people keep animals that sometimes cause traffic jams and can lead to motorists' accidents?

2. **Kwa nini watu wanafuga wanyama ambao vitendo vyao vinaweza kuangusha nguzo za umeme na kusababisha watu washituliwe na umeme?**

Why do people keep animals that their actions can cause electric poles to fall down and shock people?

3. **Kwa nini watu wanafuga wanyama ambao hulaumiwa kwamba wanaweza kuwaumiza binadamu kimwili?**

Why do people keep animals that are sometimes blamed for causing bodily harm to humans?

4. **Kwa nini watu wanafuga wanyama ambao wanaweza kuwaumiza wenda kwa miguu, watoto, wazee na wagonjwa?**

Why do people keep animals that can hurt pedestrians, children, old and sick people?

**MAMBO YANAYOHUSU MJI NA HALI YAKE**  
**CITY-LANDSCAPE ISSUES**

Taarifa/matokeo:

Information/consequences:

1. **Watu husema kwamba wanyama husababisha uharibifu kwenye nyumba za serikali, mabomba ya maji, simu na nguzo zake, na mabarabara. Wengine wanakata madai hayo. Je! wewe unafikiria nini?**

Some people say that animals cause damage to government houses, water pipes, telephone installations, and roads. Others disagree with that claim. What do you think?

2. **Watu wanadai kwamba wanyama huharibu wigo, vijito vidogo, miti ya mapambo, maua na sehemu za mapumziko. Wengine wanakata madai hayo. Je! wewe unafikiria nini kuhusu madai hayo?**

Some people claim that animals destroy the city hedges, streams, ornamental trees, flowers and parks. Others disagree. What do you think?

3. **Watu husema kwamba kuwepo kwa wanyama mjini kumeharibu uzuri wa mji. Wengine husema hiyo sio sababu. Je! wewe unafikiria nini kuhusu madai hayo?**

Some people say that the presence of animals in the city has destroyed its beauty. Others say that is not true. What do you think?

4. **Watu wanasema kwamba mabanda yanayojengwa kiholela holela na bila ufanisi wote yameufanya mji uonekane kuwa na sura mbaya. Wengine wanakataa madai hayo. Je! wewe unafikiria nini kuhusu madai hayo?**

Some people claim that the poorly designed and constructed structures (*mabanda*) to house animals cause the city to look ugly. Others disagree. What do you think?

Sababu za kuendelea:

Reasons for continuation:

1. **Kwa nini watu wanafuga wanyama mjini ambao huharibu nyumba za serikali, mabomba ya maji, simu na nguzo zake, na mabarabara?**

Why do people keep animals in the city when they damage the urban infrastructure?

2. **Kwa nini watu wanafuga wanyama mjini ambao huharibu wigo, vijito vidogo, miti ya mapambo, maua, na sehemu za mapumziko?**

Why do people keep animals when they destroy hedges, streams, ornamental trees, flowers, and parks?

3. **Kwa nini watu wanafuga wanyama mjini ambao inadaiwa kwamba kuwepo kwao kumeharibu uzuri wa mji?**

Why do people keep animals when their presence is claimed to have destroyed the beauty of the city?

4. **Kwa nini watu wanafuga wanyama mjini ambao inadaiwa kwamba mabanda walalamo yameufanya mji uonekana kuwa na sura mbaya?**

Why do people keep animals when their poorly built sheds cause the city to look ugly.

THINGS TO BE OBSERVED AND SCORED FOR EACH RESPONDENT

RESPONDENT NO.

Time of the interview:

Date of the interview:

Location of the household:

Family members present during the interview:

I. ABOUT SOCIO-DEMOGRAPHIC CHARACTERISTICS

The respondent has the following:

- Has children  N  Y -----> in Poor  Fair  Good condition
- Has a radio  N  Y -----> in Poor  Fair  Good condition
- Has a TV/Video  N  Y -----> in Poor  Fair  Good condition
- Has a bicycle  N  Y -----> in Poor  Fair  Good condition
- Has a modern house  N  Y
- Has a car  N  Y
- Has a one tone truck  N  Y
- Has a kiosk/booth  N  Y -----> in Poor  Fair  Good condition
- Has a normal house  N  Y -----> in Poor  Fair  Good condition
- Quality of family clothing Poor  Fair  Good

The walls of the house are made out of:

- concrete blocks \_\_\_\_\_
- Portland plaster \_\_\_\_\_
- poles \_\_\_\_\_
- plaster of mud \_\_\_\_\_
- mud bricks \_\_\_\_\_

House windows are made of (circle the applicable one):

- wooden frames and have glass \_\_\_\_\_
- wooden frames and pieces of timber on \_\_\_\_\_
- metal frames and ~~20~~ louvres on \_\_\_\_\_
- metal frames with glass on \_\_\_\_\_

House doors are made of:

- wooden frames with well panelled doors \_\_\_\_\_
- wooden frames with poorly nailed pieces of timber \_\_\_\_\_
- metal frames with metal doors \_\_\_\_\_

House floors are cemented  N  Y in -----> in Poor  Fair  Good condition

House roofs are painted  N  Y -----> in which colour -->  Red, Green,  ,

II. ABOUT THE PROJECTS

ABOUT DAIRY COW

Has dairy cows  N  Y -----> in Poor  Fair  Good condition

Has calves  N  Y -----> in Poor  Fair  Good condition

Has a fenced paddock  N  Y

Has seeded pastures  N  Y -----> in Poor  Fair  Good condition

If has pastures which is the seeded grass? Kikuyu grass, Bemuda grass, .....

Cows are zero-grazed  N  Y

Common cattle kept are (circle applicable ones): Hostein, Guensey, Jersey, Boran, TSZ, Crosses of .....

Milks by hand  N  Y

ABOUT CHICKEN

Has chickens  N  Y -----> in Poor  Fair  Good condition

Has a chicken shed  N  Y -----> in Poor  Fair  Good condition

Collects eggs  N  Y -----> are Small  Medium  Fairly Big

Has day-old chicks  N  Y -----> in Poor  Fair  Good condition

Keeps local fowls  N  Y

Keeps exotic crosses  N  Y

Keeps broilers  N  Y

Has a feeder mixer  N  Y

Has a labourer  N  Y

Chicken walls are made out of: (circle one of the following)

- Concrete blocks
- Mud blocks
- Used oil barrels
- Used tins
- Used packing timber
- Hardboards
- poles and dobe

Chicken roofs are made out of: (circle one of the following)

Corrugated iron sheets

Asbestos

Grass thatch

Used barrels

Used tins

Wire mesh

The distance of the chicken "house" from the living house is about (circle the appropriate one): 10 20, 30, 50, 100, 150 or more than 200 metres away.

#### ABOUT THE PIGS

Keeps pigs   -----> in Poor  Fair  Good condition

Has pig pens   -----> in Poor  Fair  Good condition

Type of pigs (circle the applicable ones): Large white, Landrace, crosses, *others* \_\_\_\_\_

#### ABOUT GOATS

Keeps goats   -----> in Poor  Fair  Good condition

Type of goats (circle the applicable one): Local, Crosses, Mubian goats

#### ABOUT THE GARDEN

Has a garden   -----> in Poor  Fair  Good condition

Has vegetables grown   -----> in Poor  Fair  Good condition

Common vegetable in the garden is: (circle one) chicha, tomatoes, eggplant, pulses, cabbage, and okra,

Size of the garden is about: (circle one) less than quarter of ha. half a ha., one ha., over one ha.

Near the garden there is water

Water plants

Has a well uses to water plants

Has organic manure   -----> in Poor Fair Good condition

Does composting

Vegetables are planted to spacings

Has a good garden layout

The respondent also works in the project

#### ABOUT FIELD CROPS

Grows field crops

Kind of field crop grown (circle the ones appl.): maize, coconut palm tree, cassava, pineapple, mango tree, cassava, plantains

Agriculturalists' Characteristics, Crops Grown, Livestock Kept and Their Total Annual Net Profits Earned From the Three Livestock Enterprises (N = 29)

Code no.	Gender	Age	Housing status <sup>a</sup>	Agric. enterprise		Yield sold per day (livestock)	Unit price <sup>b</sup>	Monthly profit <sup>b</sup>	Annual profit <sup>b</sup>	
				Crops	Livestock					
UAs 1	M	49	1	Plantains, tomatoes, mchicha, okra	2 cows, 2 c'ves <sup>c</sup> 250 layers 4 goats	15.0 <sup>d</sup> 4.0	0.2 1.2	54.0 86.4	432.0 036.8	
UAs 2	F	49	1	n.a. <sup>e</sup>	100 layers 100 broilers	2.5 <sup>f</sup> n.a.	1.0 1.0	45.0 15.0 <sup>g</sup>	40.0 180.0 <sup>g</sup>	
UAs 3	F	48	1	n.a.	2 cows, 2 c'ves 1 bull	5.0	0.2	18.0	144.0	
UAs 4	M	48	1	Plantains, mchicha, okra cabbage	150 layers 700 broilers	3.0 n.a.	1.2 1.0	64.8 105.0	777.6 1,260.0	
UAs 5	M	49	1	n.a.	4 sheep, 30 ducks 5 cows, 2 c'ves 300 broilers, 7 rabbits, 7 ducks	26.0 n.a.	0.2 1.0	93.6 45.0	748.8 540.0	
UAs 6	F	49	1	Cabbage, okra plantains, mchicha	3 cows, 5 c'ves 200 layers	11.0 3.5	0.2 1.1	39.6 69.3	316.8 831.6	
UAs 7	F	37	2	Plantains, mchicha, okra	450 broilers	n.a.	1.0	67.5	810.0	
UAs 8	M	46	2	Tomatoes, plantains, mchicha	3 cows, 4 c'ves 3 bullocks, 5 goats	18.0	0.2	64.8	518.4	
UAs 9	F	50	2	Plantains	5 cows, 6 c'ves 2 bulls	52.0	0.2	187.2	1,497.6	
UAs10	M	49	2	n.a.	2,600 broilers	n.a.	1.0	390.0	4,680.0	
UAs11	M	45	2	Plantains, okra mchicha, tomatoes	1 cow, 1 calf 800 layers 6 goats	4.0 21.0	0.2 1.2	14.4 453.6	115.2 5,443.2	
UAs12	M	47	2	n.a.	3 cows, 4 c'ves	15.0	0.2	54.0	432.0	
UAs13	M	60	3	n.a.	7 cows, 6 c'ves 1 bull, 2 goats	7.0	0.2	25.2	201.6	
UAs14	F	52	2	Tomatoes	2 cows, 2 c'ves	3.0	0.2	10.8	86.4	
UAs15	F	48	2	Mchicha, plantains	4 cows, 4 c'ves 140 layers	18.0 3.0	0.2 1.0	64.8 54.0	518.4 648.0	
UAs16	F	38	2	Plantains, mchicha, t <sup>h</sup> toes <sup>h</sup>	5 goats, 7 fowls 700 broilers	n.a.	1.0	105.0	1,260.0	
UAs17	F	47	3	n.a.	550 layers 500 broilers	13.0 n.a.	1.0 0.8	234.0 60.0	2,808.0 720.0	
UAs18	M	40	2	Mchicha	2 heifers, 180 layers 400 broilers	n.a. 4.0 n.a.	1.2 1.0	86.4 60.0	1,036.8 720.0	
UAs19	F	23	4	Mchicha, pepper eggplant	5 local fowls 200 broilers	n.a.	1.0	30.0	360.0	
UAs20	F	33	5	n.a.	1 cow, 2 c'ves 320 broilers	6.0 n.a.	0.2 1.0	57.6 48.0	460.8 576.0	
UAs21	F	46	4	Plantains	2 cows, 2 c'ves	16.0	0.2	57.6	460.8	
UAs22	F	43	4	n.a.	2 cows, 1 calf 900 broilers	18.0 n.a.	0.2 1.0	64.8 135.0	518.4 1,620.0	
UAs23	F	31	5	n.a.	1 cow, 2 c'ves 1 goat	16.0	0.2	57.6	460.8	
UAs24	F	27	6	n.a.	250 broilers	n.a.	1.0	37.5	450.0	
UAs25	F	40	6	n.a.	250 broilers	n.a.	1.0	37.5	450.0	
UAs26	F	30	7	n.a.	300 layers 500 broilers	6.0 n.a.	1.1 1.0	118.8 75.0	1,425.6 900.0	
UAs27	F	53	6	n.a.	100 broilers	n.a.	0.7	10.5	126.0	
UAs28	M	20	8	n.a.	300 broilers	n.a.	0.9	40.5	486.0	
UAs29	F	45	6	n.a.	4 cows, 3 c'ves 3 local fowls	10.0	2.0	36.0	288.0	
Total								3,374.0	36,886.0	
Average								42.8	116.0	1,272.0

Source: Survey data. Note: <sup>a</sup>For housing status: 1 = high quality government housing, 2 = Quasi-medium quality government housing, 3 = Quasi-medium quality owned housing, 4 = Medium quality owned housing, 5 = Medium quality renting housing, 6 = Low quality owned housing, 7 = Low quality renting housing, and 8 = Low quality government housing. <sup>b</sup>In thousand Tanzanian shillings (000 T. Shs.), monthly and annual profits are figures after deducting 40 percent production cost. <sup>c</sup>Stands for calves. <sup>d</sup>Milk produced per day are in kilograms and calculations are based on 8 months-lactation period. <sup>e</sup>n.a = not applicable. <sup>f</sup>Eggs laid per day are in trays and each had 30 eggs. <sup>g</sup>Monthly and annual profits for broilers are calculated based on keeping three batches of birds of the indicated figure. <sup>h</sup>Stands for tomatoes.

## Livestock Kept by Each Urban Agriculturalist and the Total Annual Net Profits Earned (T Shs '000)

Livestock enterprise									
Cows (N = 16)				Broilers (N = 16)			Layers (N = 9)		
Person No.	cows/person	litres/day	Annual profit	Person No.	Birds/person	Annual net profit	Person No.	Birds/person	Annual profit
UAs 1	2	15	432	UAs 2	100	180	UAs 1	250	1,037
UAs 3	2	5	144	UAs 4	700	1,260	UAs 2	100	540
UAs 5	5	26	748	UAs 5	300	540	UAs 4	150	778
UAs 6	3	11	316	UAs 7	450	810	UAs 6	200	832
UAs 8	3	18	518	UAs10	2,600	4,680	UAs11	800	5,443
UAs 9	5	52	1,497	UAs16	700	1,260	UAs15	140	648
UAs11	1	4	115	UAs17	500	720	UAs17	550	2,808
UAs12	3	15	432	UAs18	400	720	UAs18	180	1,037
UAs13	7	7	202	UAs19	200	360	UAs26	300	1,425
UAs14	2	3	86	UAs20	320	576			
UAs15	4	18	518	UAs22	900	1,620			
UAs20	1	16	461	UAs24	250	450			
UAs21	2	16	461	UAs25	250	450			
UAs22	2	18	518	UAs26	500	900			
UAs23	1	16	461	UAs27	100	126			
UAs29	4	10	288	UAs28	300	486			
<b>Total</b>	<b>47</b>	<b>250</b>	<b>7,197</b>		<b>8,570</b>	<b>15,138</b>		<b>2,670</b>	<b>14,548</b>
<b>Av/prs.</b>	<b>3</b>	<b>16</b>	<b>450</b>		<b>536</b>	<b>946</b>		<b>297</b>	<b>1,616</b>

Note: The average litres per cow per day was 5.3. Net profit was derived after deducting 40 percent operation cost.

**C: MAOFISA WA UENEZAJI WA ELIMU YA KILIMO/MIFUGO  
AGRICULTURE/LIVESTOCK EXTENSION PERSONNEL**

1. **Ni mikakakati ipi ya kielimu kuhusu kilimo (au ofisis yako) mmepeleka kwa wafugaji wa mjini miezi sita iliyopita?**

What educational programs about urban agriculture have you (or your office) offered in the past six months?

2. **Ni ipi kati ya miradi miwili ya kilimo cha mjini (wanyama na mazao) mabibi/mabwana shamba hutoa taarifa (elimu) zaidi? Na ni kwa nini?**

Which of the two urban agriculture enterprises (animals and crops) do your staff offer more information? Why?

3. **Je! shughuli hizo za elimu ni kati ya zile unazozifanya kwa kawaida?**

Are those programs typical of what you usually do?

4. **Kwa muda gani shughuli hizi za kutoa taarifa (elimu) ya namna hii imekuwa ikifanyika?**

How long have these programs been carried out?

5. **Je! ni kiasi gani cha matumizi ya mwaka kinatumika kwa shughuli za elimu ya kilimo cha mjini?**

What is your total annual budget from extension services to urban agriculture?

6. **Je! una wataalamu (bibi/bwana shamba) angapi wanaoshughulikia kilimo cha mjini?**

How many staffs do you have working in urban agriculture?

7. **Je! ni watu wangapi wizara /idara yako inawafikia kielimu kila mwaka?**

How many people does your department/ministry reach per year?

8. **Je! unajuaje kwamba nambari uliyoitaja hapo imefikiwa?**

How do you know that the number mentioned above has been reached?

9. **Je! ni wakulima wa aina gani kulingana na umaarufu na mishahara yao wizara/idara yako huwapa taarifa za ufugaji zaid?**

Which farmers based on their socioeconomic status does your ministry/department give more information about urban agriculture?

10. **Je! mna uhusiano gani kati ya wizara/idara yako na Halmashauri ya Jiji la Dar es Salaam katika kuangalia ufanisi wa kilimo cha mjini?**

What is your relationship with the Dar es Salaam City Council toward regulating urban agriculture activities?

11. **Je! una maoni gani kuhusu madai ya watu wanaosema kwamba kilimo cha mjini kinaharibu mazingira ya mji? Na ni namna gani mabibi/bwana shamba/mifugo wanapunguza uharibifu huo?**

What is your opinions about claims people make that urban agriculture damages the urban environment? How do extension agents lessen these damages?

12. **Je! unadhani watu wanafuga mjini wanajua kuwa wanyama wao wanaharibu mazingira ya mji?**

Do you think that people know that urban agriculture (livestock keeping) damages the urban environment?

13. **Je! ni kwa nini watu walio na taarifa kuhusu uharibifu wa mazingira unaoletwa na kilimo (ufugaji) cha mjini wanaendelea na shughuli hizo?**

Why do you think that people with information about the damaging effects of urban agriculture continue to do it?

**D: MAOFISA WA HALMASHAURI YA JIJI  
CITY COUNCIL BUREAUCRATS**

- i. **KUHUSIANA NASHERIA  
LEGAL ISSUES**

1. **Kwa nini ilikuwa muhimu kufufua sherai ndogo zinazoangalia shughuli za kilimo cha mjini?**

Why was it initially necessary to enact bylaws that regulate urban agriculture?

2. **Je! sheria hizo zimetimiza malengo yake kama zilivyokusudia?**

Have those bylaws achieved their intended goals?

3. **Je! kuna matatizo ye yote yanayofanya utekelezaji na udhibiti wa sheria ndogo hizo kuto kufanikiwa? Kama upo, ni kwa sababu gani?**

Are there any problems with regulating the bylaws? If there are any, why is it so?

4. **Kati ya sheria ndogo zinazohusu kudhibiti mifugo na mazao, ni zipi ngumu kudhibiti na ni kwa nini?**

Of the two bylaws that regulate livestock keeping and growing crops, which are difficult to regulate and why?

6. **Ni aina ya wakulima/wafugaji gani kufuatana na hali zao pamoja na mishahara yao hupatikana wanavunja sheria ndogo za kudhibiti kilimo cha mjini? Na ni kwa nini?**

Which kind of socioeconomic people are more likely to break the bylaws. And why is it so?

7. **Kufuatana na takwimu za kesi, ni watu wa aina gani huchukuliwa mahakamani kwa kufunja sheria ndogo hizi? Na ni kwa sababu gani?**

Based on the number of court cases, which kind of people are more likely to be sued for breaking the bylaws. And why is it so?

8. **Kati ya miradi miwili ya kilimo (mifugo na mazao), ni upi unavunja sheria zaidi? Na ni kwa nini?**

Of the two urban agriculture enterprises (livestock and crops), which enterprise has the most defaults of bylaws? And why is it so?

9. **Je! unadhani kwamba ki-sheria kilimo cha mjini kinaleta uharibifu wa mazingira ya mjini?**

Do you think that from a legal viewpoint urban agriculture damages the urban environment?

ii. **KUHUSIANA NA MIPANGO MIJI  
TOWN & CITY PLANNING**

1. **Ni naman gani kuwepo kwa kilimo cha mjini kumeadhiri shughuli za mipango ya mji?**

How does the existence of urban agriculture affect the activities of urban planning?

2. **Kulingana na utaalamu wa mipango miji, ni eneo la ukubwa gani la kiwanja panafaa kufuga na kuotesha mazao. Kama hivyo ni kwa nini?**

From a planning viewpoint, which plot size is ideal for keeping livestock and growing crops. If so why?

3. **Je! unadhani kwamba hapo baadaye mipango ya mjini itadi kubadili msimamo wake ili kujumuisha matakwa ya kilimo cha mjini? Kama sivyo ni kwa nini?**

Do you see that in future urban planning changing its philosophy to accommodate urban agriculture? If not why?

4. **Je! unamlaumu nani kwa kuwepo na kuendelea kwa shughuli za kilimo cha mjini?**

Whom do you blame for the existence and continuation of urban agriculture activities in the city?

5. **Kufuatana na elimu ya mipango miji, je! unafikiria kwamba kilimo hiki kinaleta uharibifu wote wa mazingira ya mjini?**

Based on urban planning knowledge, do you think that this kind of urban agriculture causes any damage on the urban environment?

6. **Je! unadhani kwamba kilimo cha mjini kinaweza kuzuiliwa kinadhifu zaidi? Kama divyo kwa namna gani?**

Do you think that urban agriculture could efficiently be regulated? If so how?

7. **Je! unaweza kunieleza zaidi namna kilimo cha mjini kinavyharibu mazingira ya mjini?**

Can you tell me anything else how urban agriculture damages the urban environment?

**iii. AFYA YA JAMII  
PUBLIC HEALTH**

- 1. Ni matatizo gani yanayohusiana na afya ya jamii yanayoletwa na kilimo cha mjini?**

What are public health problems that urban agriculture causes in the city?

- 2. Ni ipi kati ya shughuli mbili (wanyama na mazao) husababisha matatizo mengi ya kiafya mjini? Tafadhali iambie baadhi ya matatizo hayo.**

Which of the two enterprises (livestock and crops) cause the most problems on public health? Please tell me some of those problems.

- 3. Unadhani kwamba wakaazi wengi wanaofuga na kulima mjini wanajua kuhusu madhara ya kiafya kwa jamii yanayoletwa na kilimo cha mjini?**

Do you think that most urbanites who do urban agriculture know about the damaging effects it causes on the public health?

- 4. Je! serikali/wizara/idara/Halmashauri zinafanya nini kupunguza madhara kwa afya jamii yanayosababishwa na kilimo kilimo cha mjini?**

Do you think that the government/ministry/department/City Council are doing anything to lessen public health problems that urban agriculture causes?

- 5. Je! unafikia kwamba kilimo cha mjini kinaweza kuendelea bila kuleta madhara ya afya kwa jamii? Kama ndiyo, ni namna gani kinaweza kuendelezwa?**

Do you think that urban agriculture can continue without engendering any public health problems? If yes, how could this be done?

- 6. Unaweza kunielza zaidi matatizo mengine yanayoweza kuletwa na kilimo cha mjini?**

Can you tell me anything else about public health problems that urban agriculture can cause?

**E: VIKUNDI VYA KIPEKEE  
INTEREST GROUPS**

**i. KIKUNDI CHA MAZINGIRA  
ENVIRONMENTAL PERSONNEL**

- 1. Unafikiri kwamba kilimo cha mjini kinaharibu mazingira ya mjini? Kama ndivyo, kwa namna gani?**

Do you think that urban agriculture damages the urban environment? If so, how?

- 2. Jibu lako la nambari ya 1 juu lingelikuwa tofauti kama ungelifikiria wanyama pekee yao na mazao pekee?**

Would your answer to number 1 above be different if you only thought of livestock and crops separately.

- 3. Wizara/idara/shirika lako linafanya nini ili kupunguza uharibifu wa mazingira unaosababishwa na kilimo cha mjini?**

What is your ministry/department/institution doing to lessen environmental damage that urban agriculture causes?

- 4. Unafikiria kwamba kilimo cha mjini kinaweza kuendelezwa mjini bila kusababisha uharibifu wa mazingira?**

Do you think that urban agriculture can continue in the city without causing environmental damage?

- 5. Idara/shirika lako linapata misaada ipi kutoka serikalini na Halmashauri ya Jiji (DCC) katika kuzuia uharibifu uharibifu wa manzingira kutokana na kilimo cha mjini?**

What support does your department/institution get from the government and the DCC toward regulating environmental damage that urban agriculture causes?

## Characteristics of Public Officials (POs) (N = 27) Interviewed

Code no.	Gender	Place of work	Position held	Degree/Diploma held
PO 01	F	National Environmental Management Council (NEMC)	Resource assessor	M. Sc.
PO 02	M	"	"	M. Sc.
PO 03	M	"	Environmental educator	M. Sc.
PO 04	M	Dar <sup>1</sup> City planning	City planner	B. Sc.
PO 05	M	Dar Ardhi Institute	Lecturer	B. Sc.
PO 06	M	"	Lecturer	B. Sc.
PO 07	M	"	Professor	M. Sc.
PO 08	M	Min. of Land & Urban Plan.	Asst. director	M. Sc.
PO 09	M	Ministry of Health	Dir. Public Health	M. MD.
PO 10	M	Dar Health Project	Proj. Coordinator	M. MD.
PO 11	M	Dar City Council	Deputy Medical Officer	M. MD.
PO 12	M	Tanzania Standard News	Sub-editor	B.A.
PO 13	M	Dept. of Commun. Health	Lecturer	Ph.D.
PO 14	M	"	Sr. Lecturer	D. Sc.
PO 15	M	"	Lecturer	M. Sc.
PO 16	M	Inst. for Publ. Health	Director	Ph.D.
PO 17	M	Tanzania Defence Force	MP/Colonel	B. Sc.
PO 18	M	Min. of Agr/Liv. Coop. Dev.	Asst. Commissioner	M. Sc.
PO 19	M	"	Asst. Commissioner	M. Sc.
PO 20	M	"	Reg. Agr. Dev. Officer	M. Sc.
PO 21	M	"	Reg. Liv. Dev. Officer	M. V.Sc.
PO 22	F	"	Reg Ext. Officer	M. Sc.
PO 23	M	"	Ilala Vet. Officer	B. V.Sc.
PO 24	M	"	Kinondoni Vet. Officer	B. V.Sc.
PO 25	M	"	Temeke Vet. Officer	B. V.Sc.
PO 26	F	"	Field Ext. Officer	Diploma
PO 27	M	"	Field Poultry Ext. Officer	Diploma

Note: Most public officials interviewed were males because of the national educational system that favoured them. <sup>1</sup>Dar is an abbreviation for Dar es Salaam.

**INDIVIDUAL SUMMARY SHEET**

PERSON. CODE	DISTR	DENSITY	AGE	SEX	YRS IN DSM	TYPE OF U/A	YEAR ST U/A	HOUSE OWNER	FARM OUT.	SOURCE OF INFO
QUESTION			REASONS FOR CONTINUATION						CODE	
Q1									E	
									N	
									C	
									X	
Q2									E	
									N	
									C	
									X	
Q3									E	
									N	
									C	
									X	
Q4									E	
									N	
									C	
									X	

KEY:        E = ECONOMIC                    N = NUTRITIONAL                    C = CULTURAL                    X = OTHERS

Overall Data Summary Sheet (e.g., Question 1 of Psycho-social issues)

Question 1: Animals scare children.

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Tallies for NO responses:

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Tallies for YES responses:

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=====

Reasons for continuation

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Tallies for Economic responses:

---

Tallies for Nutritional responses:

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Tallies for Culture responses:

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Tallies for Other responses:

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