# INCREASING FOOD SECURITY THROUGH URBAN FARMING IN NAIROBI

*Dick Foeken and Alice Mboganie Mwangi*

## 1. Introduction

As any visitor to Kenya's capital can see, farming activities are everywhere, not only in the outskirts but also in the heart of the city. Along roadsides, in the middle of roundabouts, along and between railway lines, in parks, along rivers, under power lines, in short, in all kinds of open public spaces, crops are cultivated and animals like cattle, goats and sheep roam around. What most visitors do not see is that there is even more farming, notably in backyards in the residential areas. People of all socio-economic classes grow food whenever and wherever possible. This paper is based on the four studies that have been carried out thus far on urban farming in Nairobi.[1] By "urban farming", we mean any farming activity within the city boundaries[2], including the cultivation of food and cash crops, animal husbandry, forestry and the production of flowers and garden plants.

Nairobi is located at the southern end of Kenya's Central Highlands and lies at an altitude of between 1600 and 1800 metres above sea level (Ng'ang'a 1992). Mean annual temperature is 17°C, while the mean daily maximum and minimum are 23°C and 12°C, respectively (Situma 1992). Mean annual rainfall ranges from about 800 to about 1,050 mm, depending on altitude (Ng'ang'a 1992). Most of it falls in two distinct seasons: the long rains from mid-March to June and the short rains from mid-October to early December.

The present population of Kenya is estimated to be about 30 million. The average population growth between 1980 and 1993 was 3.3%. Due to the large influx of people from the rural areas, the population of Nairobi grew much faster, from half a million in 1969 (Kenya 1971) to an estimated 2 million in 1998 (Kenya 1996a). Most of the migrants end up in one of the low-income areas of the city. Almost half (47%) of Nairobi's population live in very-low-income neighbourhoods (Jones et al. 1995). Population densities can reach values of more than 30,000 persons/km$^2$. One of the highest densities is found in Korogocho Sub-Location, where in 1989 more than 44,000 people were packed together in an area of about one km$^2$ (Kenya 1994). Such "informal" or "uncontrolled" residential areas, as they are usually called, can be found as "pockets" all over the city (Syagga & Kiamba 1992).

**Table 1:** *Kenya and Nairobi: some basic statistics*

| | Kenya | Nairobi |
|---|---|---|
| **Area (km²)** | 580,000 | 693 |
| **Population* (million) 1989** | 21 4 | 1 3 |
| **Population (million) 1998** | 30 0 | 2 0 |
| **Growth rate 1980-1993 (%)** | 3 3 | 5 1 |

* 1989 figures from latest Population Census, 1998 figures are estimations
*Sources: Kenya 1994, 1996a.*

Urban poverty in the mid-1970s was negligible: only 2.9% of the households in Nairobi were living below the poverty line (Collier & Lal 1986). In the 1980s and 1990s, the situation changed drastically, on account of three interrelated circumstances:

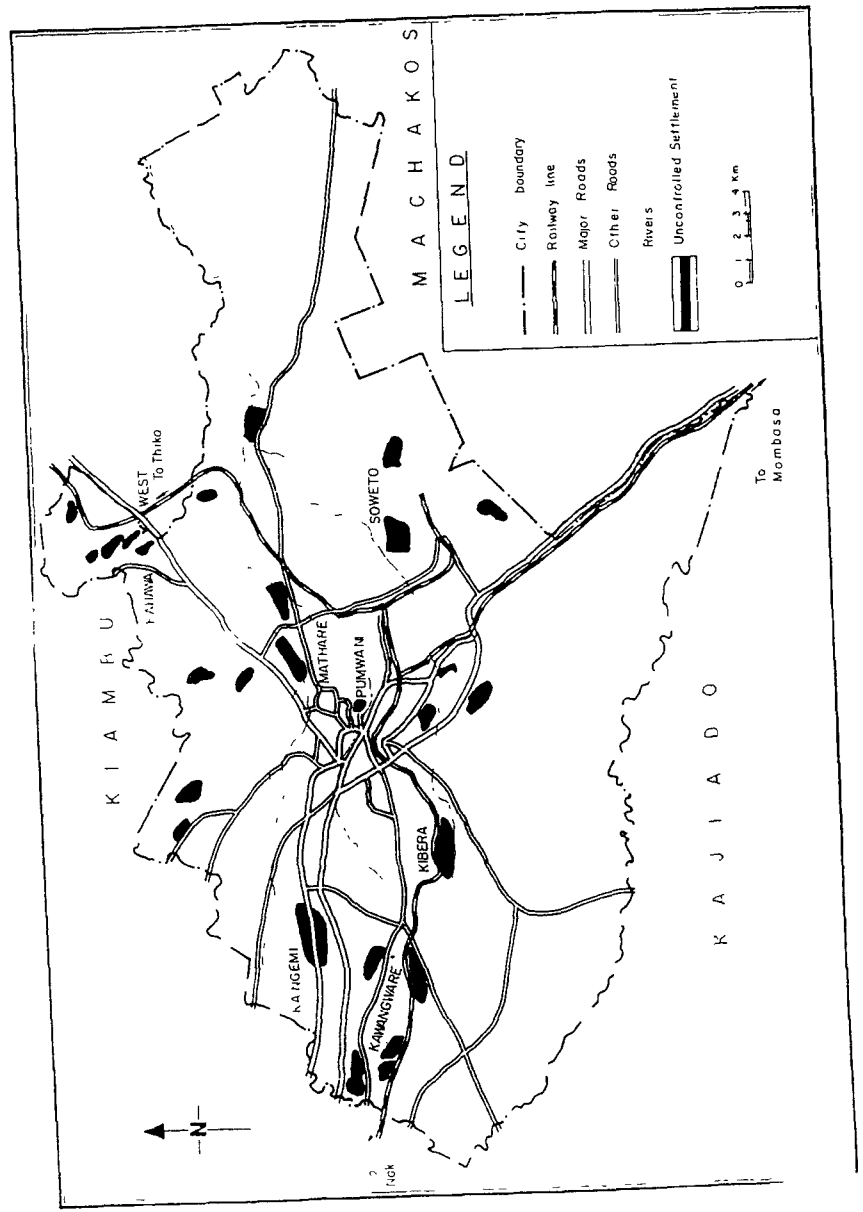
- rapid population growth as a result of both high natural increase and accelerated rural-urban migration (Nairobi's population grew at a rate of 5.1% during the 1980s);
- the on-going economic recession: economic growth declined steeply since 1980 (dropping from an average of 5% during 1978-81 to only 2.2% in 1990-91); and
- the impact of structural adjustment policies, e.g. a reduction of government spending, increased taxation, currency devaluation, increasing real producer prices for agriculture.

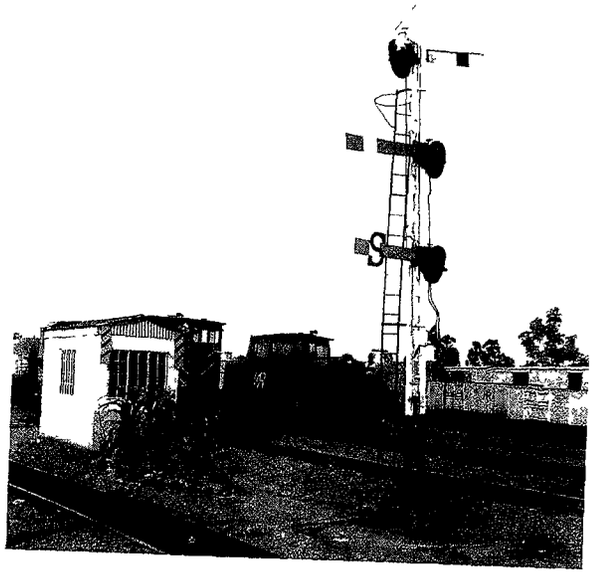
All of this has made life far more expensive for the Kenyans, and for the poor in particular. The result is that vulnerable groups like the urban poor are increasingly marginalised (KCO 1992).

The studies that have been done (Kenya 1983, Kenya 1989, Ondiege & Syagga 1990; KCO 1992) mention the various ways by which the urban poor try to make ends meet. Most poor people have no regular job and rely on casual work. Informal, micro-scale business activities are very common (including begging, theft, illegal brewing and prostitution). Some figures point this out quite dramatically. Between 1989 and 1997, the Nairobi population grew by an estimated 51%, while wage employment in the formal sector grew by only 15% (Kenya 1996b, 1998). In the 1994-97 period, wage employment in the formal sector grew by 5%, but the number of persons engaged in the informal sector increased by 65% (Kenya 1998). Nowadays, about two-thirds of the Nairobi working population depend on the informal sector for their livelihood (Kenya 1998).

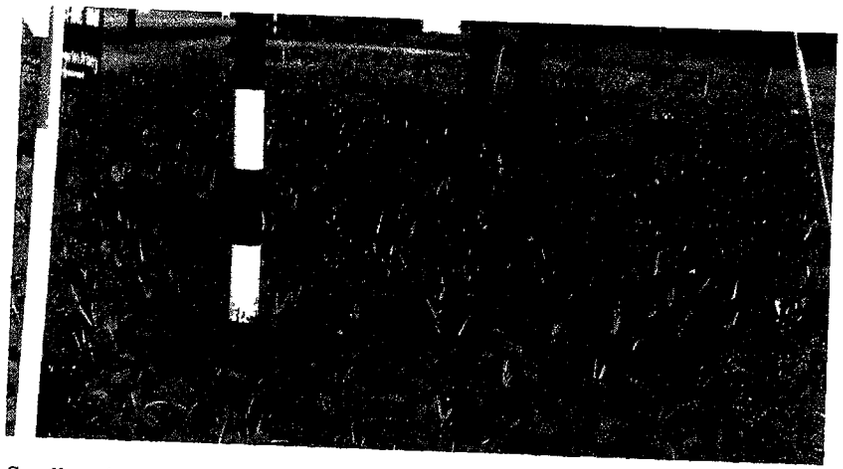
In many respects, Nairobi is not representative of urban Kenya. Being the national capital and being so much larger than any other urban centre in the country, Nairobi dominates in terms of economic, political and cultural







*Between the railway tracks near Nairobi station; crop cultivation (mainly maize) is very common (Picture Dick Foeken)*



*Small scale subsistence crop of spinach and sukuma wiki in a roundabout near Kibera, south-west Nairobi (Picture Dick Foeken)*



aspects. As a result, the city attracts a continuously large flow of migrants from all parts of the country. On the other hand, since this paper deals with urban agriculture, it should be noted that, in this respect, Nairobi is *not* very different from other urban centres in Kenya.

This became clear from the results of the survey carried out by the Mazingira Institute in 1984/85, which covered, besides Nairobi, also (in sequence of size) Mombasa, Kisumu, Kakamega, Isiolo and Kitui

## 2. Urban farming in Nairobi

In the mid-1980s, 20% of Nairobi households were growing crops within the city limits (Lee-Smith et al. 1987). Moreover, 7% appeared to keep livestock in town. Although households in all socio-economic classes do urban farming, poor(er) households are over-represented. This was confirmed by the study in the slum area of Korogocho carried out in 1994: 30% of the households could be classified as urban farmers (Mwangi & Foeken 1996) Based on these findings, it seems fair to estimate the number of households in Nairobi involved in urban farming in the late 1990s in the order of at least 150,000 [3]

Table 2 shows several characteristics of the plots used for urban farming. There are substantial differences concerning the location of plots as recorded during the various surveys [4] Although at least one-third of the plots are privately owned, i.e , usually in backyards, the people in the low-income areas can obtain a *shamba* (Swahili for plot) only on public land (roadsides, riversides) or privately-owned land belonging to somebody else (along railroads, in estates, industrial land) None of the selected farming households in Korogocho and Pumwani/Eastleigh owned a piece of land, simply because housing conditions are so crowded that not even the smallest backyard is available

Plot sizes vary considerably, both in terms of the means found in the various surveys as well as the range of sizes in each survey. Again, this can be attributed partly to sampling methods: the very small average size of 99 $m^2$ found by Lee-Smith et al in 1985 is undoubtedly related to the high percentage of backyard farming. In the three other surveys, plots were much larger, particularly in the very-low-income area of Korogocho. Since the latter area is very densely populated, most plots are located outside the built-up area in empty spaces owned by the municipality. As a result, distances between the farmers' homes and their *shambas* are quite large. This is not only time-consuming but also a disadvantage in terms of theft of crops.

**Table 2:** *Plot characteristics*

| Year of survey | 1985[a] | 1987[b] | 1994[c] | 1994[c] |
|---|---|---|---|---|
| Area | Nairobi | Nairobi | Korogocho | Pumwani/E |
| N | 154 | 618 | 48 | 62 |
| *Location of plots (%):* | | | | |
| Private residential | | 71 | 32 | - |
| Roadside | 10 | 29 | 31 | 7 |
| Riverside | 9 | 16 | 43 | 86 |
| *Plot ownership (%):* | | | | |
| Self/family | 33 | 24 | - | - |
| Private landlord | 9 | 29 | 24 | 7 |
| Public land | 51 | 45 | 74 | 93 |
| *Size of plots:* | | | | |
| Average ($m^2$) | 99 | | 3200 | 1400 |
| % >=200 $m^2$ | - | 76 | 80 | 50 |
| % >= 1000 $m^2$ | | 47 | 73 | 29 |
| *Number of plots:* | | | | |
| % hh's with 2 or more plots | 12 | 30 | 31 | 38 |
| *Distance to plots (%).* | | | | |
| <1 km | | 74 | | |
| <10 min walking | - | - | 3 | 68 |
| > 30 min walking | 83 | 6 | | |

*Sources: a) Lee-Smith et al. 1987; b) Freeman 1991, c) Mwangi 1995.*

Quite a number of farmers have access to more than one plot. Access to multiple plots has several advantages for the farmer. Different ecological qualities of the plots make it possible to widen the range of crops Moreover, plots separated from each other by considerable distances, as is often the case (Freeman 1991), reduce the risks of losses from theft, pestilence or destruction by the rightful owners of the land.

## 3. Farming practices

Roughly, four farming systems can be distinguished in Nairobi. The first one, small-scale subsistence crop cultivation, is by far the dominant type. The second type concerns small-scale livestock production, often combined with the first type. Only a few words will be spent on the third type, namely small-scale market-oriented crop production. Finally, in the south-western part of the city (Karen, Langata), some large-scale commercial farming remains from the colonial period, characterised by irrigated vegetable fields, battery hen houses and grade dairy cattle. As we have no data on this activity, this type is left out of the discussion





### 3.1 Small-scale subsistence crop cultivation

The Nairobi farmers cultivate a wide range of crops (see Appendix 1). The most commonly produced crops are listed in Table 3. Farmers always plant a variety of crops on their *shambas*. Conspicuously absent are tree crops, for reasons of limited space (many plots are too small) and uncertainty regarding land tenure. The table shows that the basic staples such as maize, beans and *sukuma wiki*[5] particularly stand out as the crops cultivated by the large majority of the farmers. In terms of frequency of plantings and overall area, maize is the prevalent crop (Freeman 1991). Under ideal conditions, maize may yield as much as 1200 kg per ha; however, Freeman estimated the average yield at 200 kg in a good season. As in the rural areas, maize is usually intercropped with beans, which is the crop second in importance in Nairobi.

**Table 3:** *Main crops produced by the Nairobi farmers*[6]

| Area | Nairobi[a] | Korogocho[b] | Pumwani / E[b] |
|---|---|---|---|
| N: | 154 | 48 | 62 |
| *sukuma wiki* | 63 | 35 | 73 |
| tomatoes | a? | 23 | 31 |
| beans | 38 | 71 | 73 |
| cow peas | 12 | 33 | 24 |
| maize | 35 | 71 | 97 |
| Irish potatoes | 14 | 23 | 26 |
| sweet potatoes | 1 | 17 | 29 |
| arrowroot | 1 | 21 | 26 |
| bananas | 2 | 17 | 47 |

a) Included in "other vegetables" (31%), see Appendix 1
*Sources: a) Lee-Smith et al. 1987; b) Mwangi 1995.*

The labour is provided mainly by women. For instance, in 80-85% of the farming households in Korogocho and Pumwani/Eastleigh, the women were responsible for the farming activities (Mwangi 1995). Cultivation practices are usually very simple: the *panga* (sturdy bush knife) and *jembe* (hoe) are about the only tools used. The use of "modern inputs" is quite limited. Maintaining or improving soil fertility is mainly done by means of animal droppings or organic material. Chemical inputs are used only by a small minority of farmers, because most farmers cannot afford them.

Table 4: *Inputs used in crop production (% of households)*

| Year of survey | 1985[a] | 1987[b] | 1994[c] | 1994[c] |
|---|---|---|---|---|
| Area | Nairobi | Nairobi | Korogocho | Pumwani/E |
| Manure | 29 | 31 | 49 | 49 |
| Guano (poultry droppings) | | 15 | | |
| Crop residues/urban waste | | | 51 | 59 |
| Compost | 35 | | | |
| Mulch | 23 | | | |
| Chemical fertiliser | 19 | 31 | 29 | 2 |
| Seedlings | 87 | | | |
| Improved seeds/seedlings | | | 51 | 30 |
| Natural pesticides | | 1 | 32 | 55 |
| Chemical pesticides | 11 | 13 | 17 | 25 |
| Fungicides | 8 | 13 | | |

*Sources: a) Lee-Smith et al. 1987; b) Freeman 1987; c) Mwangi 1995.*

Except for those who use their backyard for farming purposes, irrigation is quite rare. Freeman (1991) came across one out of eight cultivators practising some kind of irrigation. For many of the poorer farmers, only those who have plots along a river can benefit from the yearly flooding of the river bringing water and nutrients into the soil (as well as minerals that are also harmful for human consumption). Irrigation with sewage water is not uncommon in Kibera, as almost 25% of the farmers use it (Dennery 1995).

### 3.2 Small-scale livestock production

Livestock is a quite common sight, especially in the open spaces in the outskirts of the city. Freeman (1991) found that over half of "his" urban farmers kept some animals. Poultry is by far the most common species, followed by goats, cattle, sheep, rabbits and pigs (Lee-Smith et al. 1987). Lee-Smith and Memon (1994) estimated the number of cattle in Nairobi at 23,000 head. In the very-low-income area of Korogocho, where over 15,000 households are living (Kenya 1994), we estimate the number of cattle to be about 1,000, sheep 1,250, goats 2,300, chickens 4,000, rabbits 2,000 and ducks 400. If space was available, many more people would like to keep livestock. Little information is available regarding inputs used for livestock rearing. Practices like dipping, spraying, vaccinating and using veterinary drugs are not very common. This partly explains the high mortality rate among the Nairobi livestock. Most farmers give additional feeding to their animals, such as crop residues and/or urban waste.





### 3.3 Small-scale market-oriented crop cultivation

Despite its potential in terms of food, employment and income, small-scale crop production entirely for commercial purposes is a rare phenomenon in Nairobi and we know of only a few examples. The first example concerns ornamental crops, grown in plastic bags. It is commonly more well-to-do people who engage in this activity, and who have employees to run the plot. The plants are mainly seedlings sold to individuals and landscaping companies. The second case also concerns seedlings, notably of vegetables, grown on very small plots. An example is the Mathare Self-Help Group, consisting of jobless slum dwellers. The group succeeded in obtaining permission from the City Council to till land next to the road in Kariokor. The seedlings are sold to farmers as far as the rural areas of Kiambu. Finally, Freeman (1991) mentions a very special crop, notably, "natural hay". He noticed that Kikuyu women scythed the lush grass on roadside verges with their *pangas*, to be collected by dealers for selling on the market as animal fodder. Although not a cultivated crop in the strict sense, Freeman considers the crop to be "a product of the city's open spaces with evident commercial value".

### 3.4 Agricultural advice

Almost all Nairobi farmers are completely left on their own, getting no assistance or advice of any sort. However, the Ministry of Agriculture does provide extension services in Nairobi, in principle to everyone who asks for it. Yet, roadside, riverside and sewage-line farming are not recognised by the officers, as these activities have been prohibited according to the 1961 Nairobi City Council bylaws, which since then have never been reviewed (Ateka 1999). This implies that many of the poor urban cultivators do not qualify for extension.

## 4. Characteristics of the Nairobi farmers

The majority of the urban farmers in Nairobi are women. Particularly among the low-income farmers, the percentage of female-headed households is relatively high. For many poor women who lack the presence of an adult man in the house and who have children to feed, farming is something of a last resort. This has also to do with their relatively low level of education in comparison with the men, as all studies revealed. Nevertheless, it is surprising that almost one-quarter of the heads of the low-income farming households in both Korogocho and Pumwani/Eastleigh had completed secondary school education Apparently, lack of employment opportunities has forced these people into agriculture.

**Table 5:** ***Demographic characteristics of the Nairobi farmers***

| **Year of survey** | **1985**[a] | **1987**[b] | **1994**[c] | **1994**[c] |
|---|---|---|---|---|
| **Area** | Nairobi | Nairobi | Korogocho | Pumwani/E |
| **N** | 154 | 618 | 48 | 62 |
| *Gender:* | | | | |
| % female cultivators | 62 | 64 | 80-85 | 80-85 |
| % female-headed households | 11 | | 35 | 39 |
| *Household size:* | | | | |
| average No of persons | 5 4 | | 6 9 | 6 8 |
| *Age of household head:* | | | | |
| % <40 years of age | | 52 | 62 | 40 |
| *Education of hh head* | | | | |
| % no formal education | 7 | 29 | 17 | 34 |
| % at least primary school | | 43 | 69 | 48 |
| % secondary school | | | 23 | 21 |
| *Migration of hh head:* | | | | |
| % born outside Nairobi | | 87 | 90 | 73 |
| % >14 years in Nairobi | | 58 | 63 | 85 |
| *Ethnicity of hh head:* | | | | |
| Kikuyu | | ca 50* | 48 | 90 |
| Luo | | 6 | 33 | |
| Kamba | | ca 15* | 15 | 8 |

* Own estimations, based on figures in Freeman 1991 57-59
*Sources: a) Lee-Smith et al. 1987; b) Freeman 1987; c) Mwangi 1995*

Most people engaged in urban farming have been living in Nairobi for quite a long time. This rejects the view which was popular until recently that urban farmers are new migrants from rural areas simply continuing their original way of living in an urban environment before getting adapted to the urban way of life. New migrants do not come to the city to practise agriculture but rather to look for formal employment. Not succeeding in this, many of them try to get access to a piece of land in order to grow food. However, one has to be firmly settled in the city in order to be able to obtain a plot, "settled" meaning that one has to have the right personal (i.e., ethnic) network through which land can be acquired.

Relatively few people in the farming households in Nairobi are employed in the formal sector. Many are either unemployed or perform some casual labour. In the slum areas of Korogocho and Pumwani/Eastleigh, informal trade and food selling were the most frequently mentioned sources of income. Among the non-farming households in Korogocho, illegal trade and practices (like manufacturing and selling alcoholic brews, prostitution, street begging and stealing) scored high (24%) in comparison with the farmers' group (10%).



This might be an indication that lack of access to agricultural land pushes these destitute people into illegal activities.

**Table 6:** ***Socio-economic characteristics of the Nairobi farmers***

| **Year of survey** | **1987**[a] | **1994**[b] | **1994**[b] |
|---|---|---|---|
| **Area** | Nairobi | Korogocho | Pumwani/E |
| **N** | 618 | 48 | 62 |
| **Respondents** | Cultivators | All adults | All adults |
| *Employment (%)*:* | | | |
| employed in formal sector | 22 | 15 | 24 |
| casual labourer | 58 | 19 | |
| unemployed | 47 | | |
| *Household cash income (%):* | | | |
| very low income** | 43 | 33 | 44 |
| low income** | 35 | 25 | 16 |
| *% of household income spent on food:* | | | |
| 50% | 49 | 56 | 77 |
| 70% | 37 | | |
| 75% | | 35 | 36 |

* In both Lee-Smith et al (1987) and Lee-Smith et al (1988), employment figures are presented for the whole sample, but not for the sub-sample of farming households
** The figures from Freeman and Mwangi are not easily comparable, because of the different years of the surveys and different cut-off points Freeman (1991 62, 145) defined as "very low" an annual household cash income of less than KSh 10,000 and as "low" KSh 10,000-20,000 The cut-off points for the Korogocho and Pumwani/Eastleigh surveys were KSh 12,000 and KSh 24,000
*Sources: a) Freeman 1991; b) Mwangi 1995.*

The data on household incomes in the different studies cannot be easily compared, because the surveys were made in different years and had different cut-off points for the income classes. Nevertheless, the available data make it clear that most Nairobi farmers belong to the group with low to very low incomes. Generally, the farmers' households spend a very large part of their income on food; over one-third of them spend even 70 -75% of their income. This percentage would be even higher if these households were cut off from their farming activities, or otherwise they might starve from hunger.

## 5. The importance of urban farming

Lee-Smith et al. (1988) calculated the total annual crop production in the urban areas in the mid-1980s to be about 5.2 million kg. Three-quarters of this was consumed by the producers, while the rest was sold. Relatively few animals were marketed, thus adding very little to the meat supply of the city. Most animals were kept to produce manure and as a savings account for emergencies.

**Table 7[7]: *Livestock in Nairobi, total numbers, self consumed and sold, by type (1985)***

| Type | Total number | No. consumed by producer | No. sold (1984) |
|---|---|---|---|
| Cattle | 25,000 | - | - |
| Goats | 34,000 | 4,750 | 1,700 |
| Sheep | 19,000 | 1,150 | 8,000 |
| Pigs | 9,500 | - | - |
| Poultry | 260,000 | 65,000 | 5,200 |
| Rabbits | 43,500 | 11,750 | 1,750 |

*Sources: Own estimations based on Lee-Smith et al. 1988. 37-38; Kenya 1981 29; Kenya 1994 1-3.*

Farming is done primarily to improve the households' food situation. Not only the absolute amount of food, but also the dietary composition is often mentioned as a reason to practise urban farming. This explains the popularity of a crop like *sukuma wiki*. However, also others, i.e., non-farmers, can benefit from it. Farmers sell some of the vegetables often at a somewhat lower price than in the official markets.

In Korogocho, food energy intake among the group of urban farmers was somewhat higher than among the non-farmers, thanks to the Korogocho farmers' own production.[8] The same applies to the intake of proteins. In addition, the Korogocho farmers seemed to be better off in terms of material ownership, even though their monetary income was about the same. In other words, for the Korogocho farmers, urban agriculture appears to be beneficial in two ways: directly because of a greater energy and protein intake and indirectly because it enables them to spend less money on the purchase of food ("fungible income"). The higher energy intake among the Korogocho farmers was, to some extent, also translated into a better nutritional condition of the children: in terms of percentages, fewer children of farmers were wasted, stunted or "severely malnourished" than those of non-farmers (Mwangi, 1995).

Despite the subsistence character of farming in Nairobi, the importance as a source of income should not be underestimated. Selling is, in fact, quite common, also among the "subsistence" crop cultivators. However, it usually concerns small



quantities. Nevertheless, sales are important to meet other basic needs, such as maize flour, paraffin, school fees, etc. Also, those who keep livestock for subsistence sell some animals, though usually at a very marginal scale.

Most labour on the *shambas* consists of unpaid family labour. However, the small-scale market-oriented cropping sector offers some potential for employment. Most people cultivating and selling ornamental crops are employed by the owners of these businesses. However, the number of these enterprises is quite limited, so one can conclude that, in general, urban agriculture as a source of employment for people other than the actual farmers is (still) negligible.

## 6. Constraints faced by urban farmers

The Nairobi cultivators face multiple problems (Appendix 2 lists all the problems that were mentioned by the respondents in Korogocho and Pumwani/Eastleigh). Conspicuous are the high percentages of respondents in 1985 and 1987 who stated that they faced no problems. It is likely that this concerns either people who cultivate in their backyard or commercial farmers on the outskirts of Nairobi. Some of the problems mentioned by the cultivators are not specific to the urban circumstances and are the same as any rural farmer can face. In Table 8, these problems are brought together under the heading of "natural problems" Undoubtedly, the most important urban-specific problem is the theft of crops. Almost all farmers in Korogocho and Pumwani/Eastleigh mentioned this as a serious problem and, for the majority of them, it was the major problem. Popular crops with thieves are, amongst others, bananas, cocoyams and maize, as these have a ready market and are difficult to camouflage (Freeman 1993). Women are not only more prone to lose part of their crops than men; they also tend to lose larger quantities, as men are more likely and better able to guard their crops personally (*ibid.*). Although never mentioned as a (major) problem, theft of livestock also occurs.

**Table 8:** ***Constraints faced by the Nairobi farmers regarding crop cultivation (% of households)***

| **Year of survey** | **1985 [a]** | **1987 [b]** | **1994 [c]** | **1994 [c]** |
|---|---|---|---|---|
| **Area** | Nairobi | Nairobi | Korogocho | Pumwani/E |
| **No. of housholds surveyed** | 154 | 618 | 48 | 62 |
| **Type of question** | Most serious problem | First-mentioned problem* | Major problem | Major problem |
| *No problems* | 22 | 29 | - | - |
| *Natural problems:* | | | | |
| drought/lack of rain | - | 16 | 4 | - |
| flooding/waterlogging | - | 7 | - | 2 |
| poor soil | 17 | 6 | - | - |
| destruction by animals | 24 | - | - | - |
| pests/diseases | - | 10 | 17 | 2 |
| *"Urban" problems:* | | | | |
| theft of crops | 13 | 7 | 56 | 75 |
| lack of inputs/capital | 14 | 4 | 17 | 8 |
| plot used as toilet | - | - | - | 13 |
| threat of eviction/destruction | - | 4 | - | - |
| *Other problems* | 10 | 17 | 6 | - |
| ***Total*** | 100 | 100 | 100 | 100 |

*) Freeman presents the "first-mentioned" problem, assuming "that a farmer would normally mention the most pressing or important problem first" The results of the 1994 surveys indicate that this is a wrong assumption It follows that Freeman's figures may not be entirely comparable with the figures from the other surveys

*Sources: a) Lee-Smith et al. 1987; b) Freeman 1987; c) Mwangi 1995.*

Since the majority of the farmers in Nairobi are poor to very poor, many of them have no financial means to purchase inputs (see Appendix 2). Investing in maize production is discouraged because of the risk of theft, thus forcing the crop to be harvested when it is still green and much less rewarding both financially and nutritionally than dry maize.

Many farmers in Pumwani/Eastleigh faced a very specific problem, namely the use of their plots as toilets (see Appendix 2). Remarkably few farmers mentioned harassment, eviction or destruction of crops by the local authorities as a (major) problem. This is related to the question of land tenure. Uncertainty regarding the land used by cultivators was also hardly mentioned as *the* major problem. This is the more surprising as most farmers cultivate land that belongs to somebody else, hence continuously facing the risk of being evicted by the rightful owner





## 7. Urban farming and the urban environment

Very little is known about the environmental impact of farming in Nairobi. Most farming consists of subsistence crop cultivation by the poor, who usually have no money to buy chemical inputs. Hence, it is not very likely that chemical pollution due to urban farming constitutes a major concern (although on the large-scale farms on the fringe of the city, chemical inputs are undoubtedly widely used).

Soil erosion does take place in Kibera and the farmers practised various ways to keep the process under control (Dennery 1995), e.g. digging drainage ditches against gully erosion. Sheet erosion was combated with crop residues, at the same time enhancing moisture retention. In Pumwani/Eastleigh, bananas and Napier grass were planted in order to control flooding of the Nairobi River. The rivers flowing through Nairobi are heavily polluted by industrial effluent and human waste. Plots located along these rivers are flooded each year during the rainy season. Although this may be advantageous for maintaining soil fertility, crops can become seriously contaminated and can affect human beings (and animals, in the case of fodder such as Napier grass) In some areas, untreated sewage water is being used for irrigation. Dennery (1995) estimated that about one-quarter of the Kibera cultivators use sewage water.

Nairobi's solid waste is collectively dumped at Dandora (commonly known as Mukuru). The waste is never separated, which poses a number of environmental and health hazards. A group known as Mukuru Self-Help Group scavenges the dumping site for organic waste in order to make fertiliser, which is partly sold and partly used for their own vegetable production project near Dandora Catholic Church. A few garbage collectors from the city deliver some of the waste, already separated, to this group. Although the group is playing a positive role in waste recycling, the impact is no more than "a drop in the ocean".

Lee-Smith et al. (1988) found that three out of ten urban cultivators use manure to increase the soil fertility on their *shambas*. Almost 90% of these cultivators obtained it either from their own livestock or from other livestock keepers. Thus, there does exist some kind of recycling of organic material. In the very-low-income areas of Korogocho and Pumwani/Eastleigh, the use of manure in the mid-1990s was even higher (50%).

## 8. Policy aspects

Open-space planning in the city is administered by zoning regulations dating from the colonial period. Through the years. zoning regulations have changed

somewhat, particularly regarding informal sector activities. With written permission – a so-called Temporary Occupation Licence or TOL (Munari 1994; Karanja 1994) – livestock may graze on the outskirts of the city. The regulations regarding crop cultivation, however, have not changed and this is still strictly forbidden (the farms that came to be located within the city boundaries after the city expansion in 1964 are, of course, not illegal). The present policy, however, is one of ignoring the activity. The reason for tolerating it most likely has to do with the sheer magnitude of the phenomenon.

There has been only one effort to develop urban agriculture in Nairobi (Gathuru 1988; 1993a). It is part of a wider project on slum development organised by the Undugu Society of Kenya for "underprivileged" people living in the low-income area of Pumwani/Eastleigh. The Society obtained official permission from the City Council to use the land bordering the river. The project started in 1988 and its aim was to raise the level of food security for the poor. The 70 participants (all women) were given demonstrations and assistance for a period of two years and left to continue on their own with only technical advice from the Society. The technologies offered are mainly bio-intensive, including the use of organic pesticides (Gathuru 1993b). The women cultivate their plots individually, although they are organised in a group, which has collective control of use and "ownership". Crops grown were meant to be mainly vegetables for consumption and the surplus for sale. Most project farmers were quite positive about the impact of the project on their food situation (Mwangi 1995). One aspect to be noted, however, is that the project also incorporates other income-generating activities and a shelter improvement project. Although there were also people who were less positive about the urban agriculture project, it shows at least that there is potential for organising farmers and securing land for long-term agricultural use.

## 9. Prospects for urban agriculture in Nairobi

One of the more conspicuous features about Nairobi is the fact that the city still contains many open spaces, which are or can be used for farming purposes. Most of the land used to be owned by either the local authorities or the government. During the last 20 years, however, more and more land has been sold to private developers with the aim of developing it for residential purposes. This is a process that has not only been going on until today, but will continue for a long time to come, as natural increase and in-migration will cause the city population to keep on growing rapidly. As a result, slowly but surely, most of the open spaces that still exist today will be entirely built up with houses, roads and the like. From this perspective, there is not a bright future for agricultural activities in the city, for the





simple reason that agriculture cannot compete with other activities in terms of rewards.

However, besides the fact that farming in backyards is not likely to disappear, there will always remain open spaces, for instance along roads, railway lines and rivers, under power lines, etc. In other words, there is certainly potential to develop the sector. It is clear that the sector is seriously and chronically underdeveloped. It is not realistic to think that, in the very near future, urban farming will be something of the past. Many of the poor urban dwellers rely for their livelihoods to a smaller or larger extent on crop production or livestock rearing within the city boundaries. As long as there is no security of tenure, any effort to develop their farming is too risky. However, as the example of the Undugu Society project and the case of the Mathare Self-Help Group have shown, obtaining official permission to cultivate a piece of land is possible.

Many farmers are tilling plots that belong not to the local authorities, but to private landlords, and face a very uncertain future as far as their farming activities are concerned, because sooner or later the land will be developed for residential or other purposes. Still, these people could be very much helped by some form of temporary security regarding access to land. Organising themselves into a formal group (either with or without the assistance of a non-governmental organisation (NGO)) and then signing some kind of contract with the landowner, in which access to the land is guaranteed for a specific number of years, could be a great help to secure tenure, even though it is on a temporary basis. Then, at least, the farmers know where they stand.

*Using solid waste – through production:*
From Asian cities, we know that there is great potential to combine urban agriculture with such environmental considerations as solid waste disposal and treatment and use of sewage water. Using solid waste – through compost production – requires enormous financial and organisational investments, however. In the present economic situation, this is perhaps not the most realistic short-term option. Using sewage water for farming purposes is another matter. According to Ms Grootenhuis of the Green Towns Project, it is fairly easy to pipe the sewage water into a series of small ponds, in which the water becomes progressively cleaner, with the result that "the City would have less sewage water to dispose of and fewer infrastructure costs and food producers would have access to water for irrigation" (Dennery 1995: 77). Growing crops on hydroponics, possibly combined with fish farming, could be other uses. Still, this can be a realistic option only when the water is not too toxic.

Whatever effort is being undertaken to develop farming in Nairobi and particularly for the urban poor, without the local authorities' recognition that these people are permanent city residents, any actions on a scale of some size are not very likely to be successful. Formally, i.e., in terms of the City Council's policies, the urban poor hardly exist. On official maps of Nairobi, the informal residential areas (or slums) are not plotted. Specific programmes targeted at the urban poor in order to improve their nutritional situation do not exist, and they are also ignored as far as famine relief is concerned (Lee-Smith & Memon 1994). Hence, the first step to be taken has to come from the side of the Nairobi City authorities, namely, first, to admit that the slum dwellers are a fact of life, and secondly, to develop policies directed at the improvement of their living situation. Urban agriculture, then, should be part of such policies.

A second line to follow is a change of the attitudes of local governments as far as farming within town and city boundaries is concerned. For instance, in a Dutch initiative in Kenya called the Green Towns Movement (Duchhart & Grootenhuis 1993), local authorities in three selected towns (Eldoret, Nanyuki and Migori) received training in urban planning, with special emphasis on the integration of environmental issues in the Local Authorities Development Programmes. In this approach, proper urban agriculture is implicitly part of sustainable urban development. Another town in Kenya, Nakuru, is one of the four towns in the world included in a project called "Localising Agenda 21: Action Planning for Sustainable Urban Development". Funded by the Belgian Government, the objective of the project is to provide training in order to develop a new approach towards urban planning and management, focusing on environmentally-conscious development ("People's Green City"). Again, urban agriculture is part of this planning process.

The Nairobi City Council does support the Green Towns Movement, which is now implemented in twenty towns in the country (Munyua 1999). Planning includes the designation of "green zones" including riverbanks, road reserves and other open spaces. These areas are not meant for food production but for environmental conservation. "Informal food production" in these zones is not recognised. However, the kind of plants to be grown on the reserved land depends on the Ministries of Agriculture and Environment and on the local authorities. According to Munyua (1999), food production is reckoned with in the planning of medium- to low-density residential areas of Nairobi but not in high-density areas. In short, then, although the City Council does support the issue of "green cities", its policy does not touch on anything concerning urban food production for the people who most need it, the poor.





Despite two general surveys and two studies in low-income areas, knowledge on urban farming in Nairobi is far from complete. What is needed is a complete picture of what farming in Nairobi constitutes, in all its aspects: the legal and institutional setting, the farming systems and farming techniques, the environmental issues, and the socio-economic aspects. Because farming in the city has grown substantially since the first two general surveys were made, a new general survey should be carried out, as well as a number of in-depth studies covering the above-mentioned aspects. Preferably, this should be one large, integrated study, in which the local authorities should be heavily involved. Only then will it be possible to design a policy aiming at both the creation of an environmentally sound city and the welfare of the poor.

1 The first study, a general survey in six Kenyan towns, was carried out in 1984-85 by the Mazingira Institute In Nairobi, a total of 778 households were interviewed, among whom were 168 urban farmers (Lee-Smith et al 1987, Lee-Smith et al 1988, Lee-Smith & Memon 1994, Memon & Lee-Smith 1993) The second study consisted of a general survey among 618 cultivators all over Nairobi, carried out by Donald Freeman in 1987 (Freeman 1991, Freeman 1993, Lado 1990). The third study, conducted by Alice Mboganie Mwangi in 1994, focused on poor households only, notably 115 (including 48 farmers) in the Korogocho slum area, and 62 participating in an Urban Agriculture Project in Pumwani and Eastleigh Sub-Locations (Mwangi 1995, Mwangi & Foeken 1996, Foeken & Mwangi 1998) Finally, in the same year, Pascale Dennery did an anthropological study among a small number of urban farmers in Kibera (Dennery 1995, Dennery 1996)

2 Periurban agriculture refers to farming activities in the zone between the city boundaries and the rural areas, although it is often quite difficult and arbitrary to establish where "periurban" ends and "rural" begins

3 This figure is based on the following assumptions a) that the 1998 population is about 2 million (Kenya 1996a 18), b) that an average household size of 3 3 persons (which is a conservative estimation, if the declining trend between 1979 (4 13, see Kenya 1981) and 1989 (3 46, see Kenya 1994) would continue along a straight line, the average household size in 1998 would be 3, and the estimated number of households practising urban farming would be 167,000), and c) that about 25% of the population of Nairobi is engaged in urban farming

4 This is partly due to the sampling method (Lee-Smith et al used households, while Freeman selected plots) and partly to the type of survey area (Lee-Smith et al and Freeman covering the whole city area, while Mwangi's survey took place in two low-income areas only)

5 *Sukuma wiki* is a typical ingredient in the diet of the poor households, preferred as the usual supplement with the basic *ugali* dish (stiff maize porridge). It grows fast, gives high yields and has a high nutritional value

6 Data from Freeman (1991) could not be included in this table, since he presents only the percentages of plots on which a certain crop was the "dominant" one

7 The figures in Table 7 are calculated from data on livestock production presented by Lee-Smith et al (1988) and an estimated number of households in Nairobi of 300,000 (based on Kenya 1981 and Kenya,1994) It should be noted that our estimation of the number of cattle is somewhat higher than that given by Memon & Lee-Smith (23,000), probably on account of the higher total number of households in our study

8 Findings regarding the origin of energy intake (in kilocalories per consumer unit per day), (Mwangi & Foeken 1996)

| | **Farmers** | **Non-farmers** |
|---|---|---|
| **Origin of energy intake** | *(N=48)* | *(N=67)* |
| from own urban production | 263 | - |
| provided by others | 102 | 96 |
| purchased | 1539 | 1707 |
| **Total** | **1904** | **1804** |





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**Appendix 1: Crops produced by Nairobi farmers***

| Year of survey: | 1985 [a] | 1994 [b] | 1994 [b] |
|---|---|---|---|
| Area | Nairobi | Korogocho | Pumwani/E. |
| N | 154 | 58 | 99 |
| *Vegetables:* | | | |
| *Sukuma wiki* | 63 | 35 | 73 |
| Onions/leafy onions | 12 | 4 | 11 |
| Leafy onions | | 10 | 24 |
| Spinach | 10 | 8 | 13 |
| Cabbage | 2 | 2 | 3 |
| Tomatoes | | 23 | 31 |
| Other vegetables | 31 | - | - |
| Amaranth | | 17 | 36 |
| Egg plant | | - | 2 |
| *Legumes:* | | | |
| Beans | 38 | 71 | 73 |
| Cow peas | 12 | 33 | 24 |
| Peas | 1 | | |
| Garden peas | | 4 | 8 |
| Pigeon peas | | 6 | - |
| Green grams | - | - | 2 |
| *Cereals:* | | | |
| Maize | 35 | 71 | 97 |
| Sorghum | | 10 | - |
| Finger millet | | 2 | - |
| Other cereals | 1 | - | - |
| *Root crops:* | | | |
| Irish potatoes | 14 | 23 | 26 |
| Sweet potatoes | 1 | 17 | 29 |
| Arrowroot | 1 | 21 | 26 |
| Cassava | - | 13 | 8 |
| Other root crops | 1 | - | - |
| *Fruits:* | | | |
| Bananas | 2 | 17 | 47 |
| Citrus | 1 | - | - |
| Pumpkin | - | 10 | 23 |
| *Cash crops:* | | | |
| Sugarcane | - | 4 | 13 |
| Other cash crops | 1 | - | - |
| Napier grass | | 2 | 11 |

*) Data from Freeman (1991) are not included, as this study presents only percentages of plots on which a certain crop was "dominant"

*Sources: a) Lee-Smith et al 1987, b) Mwangi 1995*





**Appendix 2: Korogocho and Pumwani/Eastleigh: problems regarding urban agriculture**

| Area | Korogocho | Pumwani/Eastleigh |
|---|---|---|
| **Problems in (%) of households** | | |
| **Number of households** | 48 | 62 |
| *No problems (%)* | - | - |
| *Natural problems:* | | |
| Lack of rain (%) | 13 | 7 |
| Flooding (%) | 2 | 19 |
| Soil erosion | 4 | - |
| Pests/diseases | 58 | 53 |
| Poor yields | 2 | - |
| *"Urban" problems:* | | |
| Access to land | 4 | 2 |
| No land security | 4 | 18 |
| Harassment | 15 | 3 |
| No technical advice | 2 | - |
| Transportation | 2 | - |
| Theft of crops | 81 | 94 |
| Lack of capital | 29 | 16 |
| Lack of inputs | 10 | 10 |
| Lack of tools | 2 | 10 |
| No assisting labour | - | 2 |
| Access to food for livestock | 4 | - |
| Plot used as toilet | - | 31 |
| Jealousy | 2 | - |

*Source: 1994 survey.*