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# Urban farmers in Nakuru, Kenya

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## Foreword

The underlying report contains the result of a general survey, carried out in June-July 1999, on farming practices performed by the inhabitants of Nakuru town. This survey is the first part of a larger research project on farming by urban dwellers in Nakuru and which is a joint undertaking by the University of Nairobi (Department of Geography, Department of Urban and Regional Planning, Centre for Urban Research) and the African Studies Centre, Leiden, The Netherlands. The two major objectives of the survey were: (1) to collect basic data on farming by the Nakuru townspeople, and (2) to provide the municipal authorities of Nakuru with information on urban agriculture which can be used in the process of town planning which is taking shape in the context of the Localising Agenda 21 programme.

Sub-objectives of the survey are to provide data on such topics as: (•) the extent of farming in Nakuru town in terms of both geographical distribution and numbers of households; (•) the types of farming in town; (•) the amounts of food produced; (•) the types of inputs used; (•) the constraints faced with farming in town; (•) the characteristics of the urban farming households as opposed to the non-farming households; (•) the reasons to farm in town and the importance attached to it. A specific part of the survey was devoted to some questions on the extent of *rural* farming by the Nakuru town dwellers, the results of which are presented in a separate chapter (9).

As mentioned, the 1999 survey is 'only' the first part of a more extensive research project. More detailed information will be gathered during a number of sub-studies. First, two follow-up studies of the general survey will be carried out: (1) an in-depth survey among a selected number of households from the general survey covering a whole range of topics regarding urban farming practices in Nakuru town, and (2) a study on the impact of urban farming on the food security situation and the nutritional condition of the households involved. Second, smaller, specific studies will be dealing with various other topics related to urban farming in Nakuru:

- a comparison between a group of households taking part in an urban agriculture programme of the Catholic Diocese of Nakuru and a group of urban farming

households not participating in such a programme;

- the environmental aspects of urban farming, in particular the pollution of crops;
- institutional urban farming, in particular by the primary and secondary schools; and
- the legal and institutional aspects of farming in town.

Finally, a larger (PhD) study will deal with the *rural* farming activities by the Nakuru townspeople.

Many people were, directly or indirectly, involved in the 1999 survey. We would like to thank first of all the representatives of the local officers who were, in one way or the other, helpful with the realisation of the work, in particular Mr. S.C. Kiarie (Public Health Officer), Mr. Paul G. Chege (Town Planner), Mr. N. Githire (Municipal Architect), Mr. J. Michoma (Director of Housing and Social Services), Mr. J.T. Muchoki (District Agricultural Officer), and Mr. H. Musoga (Provincial Physical Planning Officer). Our special gratitude goes to Ms. Miriam Muthoni Ngotho (SENVINET: Schools Environmental Network) and Mr. William N. Keyah (Catholic Diocese of Nakuru, Agricultural & Rural Development Programme) who were very helpful with designing the questionnaire and providing assistants while the former played a crucial role as co-supervisor during the survey. Half of the assistants were provided by the Provincial Statistical Officer, Ms. Pamela Audi, for which we are very grateful.

The work would not have materialised as it did without the input of the twelve assistants in the field: Daniel Ochieng' Okoo, Paul Munyao, Raphael Ndereba Nderitu, Joel Mulwa Nzivo, Laurian Apolu Nambubi, Timothy Otieno, Peter K. Kimani, Thomas Chesenge, Jane Mukami, Alice Mwihaki, Lydia Kerubo Michoma, John N. Wangurunga, we thank you all very much. The completion of the data entry took place in Nairobi and was done by Sam Ade Bwana.

Finally, before publication of this report, a draft version was discussed with a small group of local key persons, namely the above-mentioned Mr. Paul G. Chege and Mr. William N. Keyah, as well as Mr. Stephen N. Kimani (Public Health Officer, Nakuru Municipality), Ms. Seraphine M. Atambo (Agricultural Officer, Nakuru Municipality) and Mr. Erastus M. Mukuna (teacher, NAROKA group, urban farmer).

# Chapter 1

## Introduction

### URBANIZATION

In June 1996, the second world-wide Habitat Conference took place in Istanbul. The conference was entirely devoted to the rapidly increasing urban population in the world and the concomitant problems regarding urban management. In the beginning of the 20th century only 13% of the world's population were living in cities, but by the year 2010 over half of all people on earth will be urbanites (UNCHS 1996: 12). Especially in the Developing Countries, the urbanization process is taking place at an extremely fast rate: between 1950 and 1990, the urban population increased from 300 millions to about 1.3 billions and will be over 2 billion by the year 2000 (Burgess, Carmona & Holstee 1996: 2). Although Sub-Sahara Africa is still the least urbanized continent in the world, during recent decades it has known the most rapid growth of the urban population (UNCHS 1996: 84). By the year 2000, it is expected that over 40% of the population of Sub-Sahara Africa will be living in urban areas (United Nations 1995).

Besides natural growth, a major cause of the rapidly increasing urban population is the influx of migrants from the rural areas. Most of these migrants have only one way to go as soon as they have reached the city, notably to one of the slums or shantytowns where the urban poor live. Since the beginning of the 1980s in particular, these low income areas have grown substantially. It was estimated that in 1993 about 55% of the Nairobi population of about 1.5 million lived in these 'unplanned' and 'unserved' areas (Gathuru 1993).

For many of these slum dwellers, it is very hard to find employment. Moreover, by the early 1990s, most African countries were implementing structural adjustment programmes (SAPs), implying, amongst others, drastic cuts in public expenditures,

trade liberalization, increased interest rates and devaluation. As a consequence, unemployment increased and real incomes fell, while at the same time prices rose and welfare services declined. Particularly the urban poor were hard hit (Tinker 1994; Drakakis-Smith, Bowyer-Bower & Tevera 1995).

For these reasons, in order to make a living or to at least maintain their present standard of living, an increasing number of African urbanites had to resort to all kinds of income-generating activities in the urban informal sector or started with some farming activity (although one can also argue that urban farming, especially where it concerns the poor households, is part of the urban informal sector; see e.g. Lee-Smith & Memon 1994). The growth of urban farming during the last two decades is generally considered as a response — particularly but certainly not only by the urban poor — to the declining economic situation, as can be seen in for instance Lusaka (Sanyal 1985), Nairobi (Freeman 1991) and Addis Ababa (Egziabher 1994).

#### URBAN FARMERS

Farming by urban dwellers is not synonymous with urban agriculture. The latter is usually defined as any agricultural activity — i.e. both growing crops and animal husbandry — either within the city boundaries or in the peri-urban areas (Mougeot 1994), although it is often not easy to determine the boundaries between urban, peri-urban and rural (Tinker 1994). In the present study, the geographical-administrative definition is used: any agricultural activity within the administrative boundary of the urban centre. 'Urban' in the strict sense refers to the (more or less densely) built-up area and 'peri-urban' to the area between the built-up area and the administrative boundary (although admittedly, also in this case the distinction between 'urban' and 'peri-urban' can be problematic).

Urban dwellers can also practice farming in the *rural* areas, however, usually in the region where they grew up. Nowadays, studies on the food availability of the urban poor always include the role of urban agriculture, but rural agriculture as a source of food is seldom looked at. Both types of farming by urban dwellers will now briefly be discussed.

Three types of urban agriculture can be distinguished (Memon & Lee-Smith 1993;

Streiffeler 1994). First, households grow food or keep some small animals in their own gardens, also called on-plot cultivation. The plot is located near the house and is usually owned by the urban dweller. Second, crops can be cultivated or animals kept on public land, i.e. along roads, railways and rivers, under power lines, in parks, or in any other unused, open urban space. This can be labelled as off-plot cultivation and is typical for the urban poor. Finally, due to the extension of town and city boundaries, former rural areas have become part of the urban area. As a rule, these 'peri-urban' farmers are the owners of the plots (although there are exceptions; see e.g. Igoche 1995).

According to Maxwell (1994; 1995), people practise urban farming for one (or more) of the four following reasons: (1) as a commercial undertaking, (2) to try to reach food self-sufficiency, (3) to raise the household's level of food security, or (4) to survive. The large majority of the African urban farmers do so for the third reason, although for many of the poorest it can be a matter of survival (Rogerson 1992; Sawio 1994). The 'survival' group can be considered as a more extreme form of the third group (Maxwell 1994). This concerns usually off-plot cultivation. In general, farming is first of all done for self-consumption, not much of the produce is sold. With the money that is indirectly saved by having to buy less food all kinds of other necessary spendings can be done (Mougeot 1994; Mwangi 1995). The importance of producing at least part of one's own food needs is revealed by surveys conducted in the late 1980s showing that poor urban households in various large cities in Third World countries (including African cities: Bamako, Nairobi and Dar es Salaam) spent 60-90% of their income on food (Mougeot 1993).

As mentioned above, farming by urban dwellers does not necessarily take place within the city boundaries. Many urbanites have access to land in the rural areas, usually in the areas where they came from. However, very little is known about the importance of rural farming for urban dwellers, particularly the urban poor. The very few studies that have been carried out so far indicate that access to rural land can be crucial for their socio-economic security (Potts & Mutambirwa 1990) or is an important element in household diversification strategies (Baker 1994), reason to devote special attention to this phenomenon in this research project.

## URBAN FARMERS IN KENYA

The first and up to now most comprehensive study on urban agriculture in Kenya was the one carried out by the Mazingira Institute in 1985 (Lee Smith et al. 1987; Memon and Lee-Smith 1993; Lee-Smith and Memon 1994). The study was carried out in six towns of various sizes (including Nairobi) thought to be representative of 'urban Kenya' as a whole. The study population consisted of households from all income categories. It was found that farming is a very common activity among urban households: almost two-thirds grew part of their food; 29% of the urban households did so within the boundaries of the town in which they lived (i.e. urban agriculture *per se*). Almost half of the households kept animals; 17% did so within the town boundaries. It was estimated that about 25 million kg of crops were produced in Kenya's urban areas in one season and some 1.4 million animals were kept. Most of the agricultural produce — both crops and animals — was meant for subsistence purposes, which is related to the fact that most urban farmers appeared to be women and that most households carrying out urban farming belonged to the lower income categories.

All other studies regarding urban agriculture in Kenya focused on the country's capital, Nairobi. Freeman undertook a survey in nine randomly selected open spaces in Nairobi in 1987, using plots to locate respondents (Lado 1990; Freeman 1991, 1993). Mwangi as well as Dennery concentrated on Nairobi's poor, the former studying the importance of urban farming for the households' food security and nutritional condition, the latter on decision-making among food producers (Mwangi 1995; Mwangi & Foeken 1996; Foeken & Mwangi 1998; Dennery 1995, 1996). What is common in all these studies is not only the widespread occurrence of food production within a city like Nairobi, but also the practice of 'traditional' farming systems and the use of 'traditional' farming techniques, the importance of urban food production as a source of both food and income, and the constraints the producers face. As for the economic value of urban farming, it is especially important for the low-income groups, and female-headed households in particular. Regarding the constraints, pests and diseases, theft and lack of access to land are the prevailing problems.

In the Mazingira study of 1985 it was found that 55% of the Kenyan low-income urban population stated to have access to rural land (Lee-Smith et al. 1987), while at

least one-third of them stated to have livestock back in the rural areas (Lee-Smith & Memon 1994). As for access to rural land, the same figure was found in 1994 among households in a Nairobi slum area (Mwangi 1995). Of the latter, 44% said to be the actual owners of the plot(s), while in all other cases parents or relatives appeared to be the owners. However, ownership by the urban households did not automatically mean that they also used the plot themselves: exactly half of the rural plots owned by the urban households were either let to be used freely by others (mostly relatives) or were left idle. Further analysis of the 1994 data indicated that those of the urban poor who did have access to rural land were better off in terms of food security than those who did not (Foeken & Mwangi 1998).

#### RELEVANCE OF THE STUDY

Urban farming is often considered as part of the informal economy, although some critics maintain that it does not belong to the informal sector either because of its mainly subsistence nature (at least in Sub-Saharan Africa). What is relevant, however, is that for some urban groups, agricultural activities are extremely important, in the sense that it is part of a strategy of income diversification necessary to maintain a certain level of living or even to survive. From this point of view, farming by urban dwellers is related to declining purchasing power and to urban poverty, which in its turn is partly the result of the economic crisis prevalent in most African countries. Because of their combined productive and reproductive responsibilities, the role of urban women is crucial in this respect.

It is increasingly being recognized that urban farming is an element of the wider urban environment (and, hence, an aspect of urban management and urban development). Households engaged in farming activities within the town or city boundaries make use of urban resources such as land and water, but often in a detrimental way. Moreover, access to these resources is limited and hence highly competitive and can easily lead to conflicts, not only between the producers but also between producers and local authorities. By regulating and guiding farming practices it is believed that not only the producers but also the urban environment as a whole will benefit, thus making urban development 'sustainable'.

Finally, the study also fits in the debate on rural-urban linkages. During the past

decades, it has become increasingly clear that the rural and urban economies in Africa (as elsewhere) are very much intertwined. This is mostly seen in terms of the social relationships between urban residents and their relatives in the areas of origin and the flow of resources — usually in the form of remittances — from urban to rural areas. The reverse flow is not considered, even though a few studies indicate that poor urban households do rely on rural farming activities for food and/or income.

## Chapter 2

# Nakuru town

### NATURAL STRUCTURE

Nakuru is located in the heart of the Great Rift Valley between latitude 0°10' and 0°20' South and longitude 36° and 36°10' East, at a distance of 160 km north-west of Nairobi. The largest part of the town lies at an altitude of about 1700 metres above sea level. In the northern part, on the slopes of the Menengai Crater, the altitude rises to about 1850 metres. Nakuru is located in the midst of a concentration of geographical features together constituting the Lake Nakuru catchment basin. These include the Menengai Crater to the north, the Bahati Highlands to the northeast, the Eburu Hills and Lake Nakuru to the south and the Mau Escarpment to the southwest. The lake water catchment is served by an array of small, seasonal rivers, including the Enjoro and Ng'ossor which flow through the town.

With an average annual rainfall of about 950 mm, Nakuru has a dry sub-humid equatorial climate. There are two rainy seasons: the long rains during March-May and the short rains during October-December. Due to its location on the floor of the Rift Valley with its volcanic soils, during the dry season Nakuru is engulfed with whirlwinds of dust, giving the town its name (*nakuru* means 'a place of winds' in the Maasai language).

### HISTORICAL DEVELOPMENT

Until the arrival of the railway in the beginning of the twentieth century, the area now constituting Nakuru was used as grazing land by pastoral communities, mainly the Maasai (MCN 1999). Like Nairobi and Kisumu, Nakuru originated (in 1904) as a railway station on the great East African Railway (or Uganda Railway) between the city-port of Mombasa on the Indian Ocean coast and Port Florence (present Kisumu)

Map 2.1: Kenya and location of Nakuru town

on Lake Victoria. Being located in the so-called 'White Highlands' (the area of large farms owned by European settlers), Nakuru soon developed into an important regional trading and market centre and became the capital of the district with the same name and of Kenya's largest province, Rift Valley Province.

During the colonial period, Nakuru was a very much planned settlement, i.e. a square grid cut in two by the railway (De Meulder 1998; MCN 1999). North of the railway contained the railway depots. The section south of the railway was the actual settlement, with its administrative, commercial and residential zones. The street pattern was as simple as it was efficient: streets with an east-west direction were called 'avenues' (numbered from 1 to 6) and streets with a north-south orientation were called 'roads'. Already during the 1920s, the town began to grow outside the original grid (Map 2.2). In the zoning plan of 1929 (the so-called Ballenden plan), Nakuru's further expansion was laid down, in accordance with the then generally accepted principles of functional zoning, i.e. with an industrial quarter, residential districts for the various social classes, a suitable location for a hospital and cemetery, recreational facilities, a site for the airfield, etc. One of the special residential quarters, to the south-east of the original grid, was Bondeni, meant for the Asian community. After the Second World War, and in particular after Independence (1963), public housing complexes were set up for the African population. Thus, Nakuru was transformed from a colonial, European town to an African town.

Since independence (1963), Nakuru has known three major extensions of its boundaries, namely in 1963, in 1972 and the latest one in 1992 (Map 2.2). The present built-up area coincides largely with the 1972 boundary (see below). With the extension of 1992, Lake Nakuru National Park became located within the Municipality's boundaries, as well as a stretch of agricultural land to the northwest of the Park (and a narrow strip bordering the northeastern boundary of the Park, which is also an agricultural area). Due to the subdivision of former farms into small plots for residential use, this stretch is now a largely sub-urban area, be it with a strong agricultural character. Another sub-urban area extends to the north of the town, mainly on the slopes of the crater. Although this area falls outside the municipal boundaries, it is part of the Nakuru planning area (or the Nakuru Metropolitan Area as it is called). The total area of the municipality is about 300 km<sup>2</sup>, of which 40 km<sup>2</sup>

Map 2.2: Evolution of the boundaries of Nakuru town  
(From MCN 1999, Fig. 3.4, p. 31)

is covered by the lake. Due to the fact that the town is being squeezed between the Menengai Crater in the north and Lake Nakuru National Park in the south, the present expansion occurs mainly in eastern and western directions, giving the town its elongated, east-westerly shape.

#### POPULATION GROWTH

During the past 30 years, the population of Nakuru town increased with a factor five. In 1969, the population was 47,151 (Kenya 1970), increasing to 92,851 in 1979 (Kenya 1981) and 163,982 in 1989 (Kenya 1994). Nowadays, Nakuru is the fourth largest town in Kenya (after Nairobi, Mombasa and Kisumu), with a 1999 population of 239,000 (Kenya 2000). Intercensal annual growth seems to have continuously declined since 1969, namely from 7.8% between 1969 and 1979 to 6.5% between 1979 and 1989 and to 4.3% between 1989 and 1999. The annual growth figure of 7.8% for the 1969-79 period may be misleading, however, due to the boundary extension of 1972 (see Map 2.2), so that in reality the growth rate during this period may have been lower than during the following decade. In 1992, there was another boundary extension; in other words, the 4.3% growth rate during the 1989-99 period is to some extent an exaggeration as well. The conclusion is that urbanization in Nakuru has decreased substantially and more rapidly than envisaged.

#### ECONOMIC STRUCTURE

The major economic sectors of Nakuru are commerce, industry, tourism, agriculture and tertiary services. Commercial activities are concentrated in the original Central Business District (CBD) and along various strips and in several smaller nodes (Map 2.3). Informal commercial activities have become an increasingly common feature in the town. Small-scale business and hawking activities are concentrated at major transport termini and on the reserves of busy internal roads (MCN 1999).

Nakuru is called the 'farmers capital' of Kenya and is famous for its agro-based industries. There are over 100 agro-industrial establishments ranging from food processing to farm machinery assembly (MCN 1999). These industries mainly serve the rich agricultural hinterland. The main industrial zone is located west of the CBD (Map 2.3). More recently, a second industrial zone has developed in the east, attracting all kinds of related urban development activities there.

**Map 2.3: Economic structure**  
(From MCN 1999, Fig. 3.9, p. 45)

There are several tourist attractions in and around the town. Of these, Lake Nakuru National Park is by far the most important one, attracting visitors from all over the world. Minor attractions are the Menengai Crater and two archaeological sites. Furthermore, Nakuru offers a central point of departure to various other attractions in the Rift Valley region (such as Lake Bogoria and Lake Baringo).

Besides being the 'farmers capital', there is both large-scale and small-scale farming within the boundaries of the municipality. Large farms can be found in the west (Map 2.3), including the giant farm of the Rift Valley Institute of Science and Technology (RVIST). Small-scale farming activities are growing within the municipality (MCN 1999). This is mostly located in the peri-urban areas. The former rural area south of the Enjoro River in the southwestern part of the town, which became part of the municipality after the boundary extension of 1992 (see Map 2.2), is such an area. Many farms have been subdivided into small-holder portions and urban residential plots. Nevertheless, farming is still the main activity there.<sup>1</sup>

Besides these economic activities, Nakuru town is an important transport and administrative centre. The 'rail-road ribbon' of both the Mombasa-Nairobi-Kisumu/Uganda railroad and the Mombasa-Nairobi-Eldoret/Kisumu/Uganda road runs through the centre of the town. This ribbon has attracted all kinds of support facilities (such as petrol stations). The town is also an important administrative centre. Being the capital of Kenya's most populous district — Nakuru District, with a population of 1.2 million in 1999 — and the country's largest province — Rift Valley Province, with a 1999 population of 7 million (Kenya 2000) — the town houses a wide range of offices offering many people employment in the administrative sector.

#### LAND TENURE AND SETTLEMENT STRUCTURE

During pre-colonial times, land was in communal ownership. Nowadays, all land is in public or private ownership. Public land is owned by either the municipal council or the central government and is either used for municipal and government purposes or leased out for a specified period to individuals for various predetermined urban

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<sup>1</sup> More detailed information on farming in Nakuru town is presented below.

**Map 2.4: Structure of housing**  
(From MCN 1999, Fig. 3.6, p. 37)

land-use activities (MCN 1999). Public land constitutes the bulk of the municipal area. Except for the above-mentioned area south of the Enjoro River, which is private land, nearly all residential estates concerns leased-out public land.

Urban farming is highly dependent on the availability of space. In other words, housing density, more than population density, determines whether farming in a certain residential estate is possible and to what extent. Most of the low-density housing areas are located north of the rail-road ribbon, while south of that line the medium and high-density housing areas prevail (Map 2.4). To some extent, housing densities coincide with income levels, in the sense that high-income areas have generally low densities (such as Milimani in the north) while low-income areas have high densities (such as Kwa Rhonda in the southwest). However, low-income areas with quite low housing densities also exist, examples being Ziwani, Flamingo and Kivumbini estates.

#### ENVIRONMENTAL INFRASTRUCTURE

The sewage disposal in Nakuru town is done through sewer reticulation, septic tanks and cesspools and pit latrines. There are two sewage treatment works (indicated with an 'S' on Map 2.4), the Old Town treatment works within the boundaries of Lake Nakuru National Park and the newer and bigger Njoro treatment works in the southwest, both using stabilisation ponds as treatment mechanism (MCN 1999). The capacity of the sewage system is underutilized, mainly because of the inadequate sewage network (only 19% of the built-up area is served by the sewage network). According to one of our informants from the Municipal Council, the underutilization of the Old Town treatment works is partly caused by the fact that people living just north of the Park boundary use the sewage water for irrigation purposes. This is an area (Block 14) with a lot of open space intensively used for crop cultivation.

In Nakuru, a lot of solid waste is generated from household, commercial and industrial activities. However, waste collection and disposal services are highly inadequate and are limited to the old town (MCN 1999). In many residential areas, waste collection relies on private initiatives, including some non-governmental and community-based organisations. There is one designated dumping site located in the northwest of the town. This is a natural ravine where the waste is dumped without

any form of separation. Where the ravine has been filled up, the garbage has been covered with a thin layer of soil where food crops are now being cultivated.

#### FARMING IN NAKURU TOWN<sup>2</sup>

According to the municipal by-laws, farming practices are forbidden within the town's boundaries. The problem for the municipality is that the enforcement capacity is too small; hence, farming in town has become a very common phenomenon. Nowadays, the municipality allows crop cultivation as long as the crop is less than one metre high. Although that excludes maize, even this crop can be seen everywhere. Most people cultivate the common food crops, mostly for their own consumption. Crops like kales, cow peas and spinach are also cultivated for commercial purposes, as there is a ready market for these products.

Many people also keep one or more animals. According to information from the local branch of the Ministry of Agriculture, there are about 160,000 head of poultry in the municipality, 25,000 head of cattle (of which 23,000 under free range and 2,000 in zero-grazing), 3,000 goats, 3,500 sheep and 1,500 pigs. Moreover, there are five farmers who keep bees.

According to the Public Health Act, farming is prohibited if it causes a nuisance for others. Fly breeding, mosquito breeding, disposal of dirty water, pollution of wells, foul smells etc. are considered nuisances, some of which can bring all kinds of diseases, such as malaria, typhoid, cholera, diarrhoea etc. Pigs are usually the greatest nuisance.

One of the municipal officers distinguished three types of urban agriculture in Nakuru. First, there is farming in privately-owned compounds (on-plot farming). A wide variety of farming activities can be found there, partly because there is little control from the side of the municipality. Second, there is farming in the compounds of the municipal residential estates. These are rented houses, but farming is very common either in the compounds of the individual renters or between the housing

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<sup>2</sup> The information in this section was collected before the survey of 1999 and is largely based on personal communication with representatives from the municipality, the district, the Catholic Diocese of Nakuru, several community-based organisations and some urban farmers. What is presented here reflects the perceptions of several key informants on urban agriculture in the town.

blocks. Finally, off-plot farming by poor people on land that does not belong to them also occurs in Nakuru. According to the informant, this type is quite common, too.

#### "LOCALISING AGENDA 21"

Nakuru is one of the three towns in the world where *Localising Agenda 21: Action Planning for Sustainable Urban Development* is being implemented (the others are Essaouira in Morocco and Vinh City in Vietnam; see Tuts 1998). This programme, launched by UNCHS (Habitat), is a direct result of the Earth Summit of Rio de Janeiro in 1992 and is based on the awareness that urban development and environmental protection have to be harmonized in order to make urban development sustainable.

The objective of the programme is to provide training in order to develop a new approach towards urban planning and management, focusing on an environmentally-conscious development of Nakuru ("People's Green City"), with particular attention to the low-income groups. The first step was the organisation of a Consultative Workshop in 1995, bringing together a wide range of stakeholders in Nakuru, including Councillors, officers of the Municipal Council, District and Province, research and training institutions, parastatals, non-governmental organisations (NGOs), community-based organisations (CBOs), industrialists and others (UNCHS/PGCHS n.d.). The workshop reached a common understanding of the factors promoting and hindering the sustainable development of Nakuru. The result of the workshop was an *Urban Pact*, amongst others expressing the visions concerning the desirable development of Nakuru Municipality.

One of these visions is Nakuru as an 'eco-town', integrating natural and human imperatives. Inevitably, urban agriculture is an integral part of this 'vision'. Urban agriculture is a fact of life which cannot be ignored when planning for sustainable planning in the town. As Kulshreshtha (1998: 47) puts it:

The assimilation of agriculture as an integral urban function and the protection of the agricultural lands from the threats of expansion of other urban land uses, have become important development imperatives for Nakuru. In the face of slow industrial growth and investment in Nakuru, urban agriculture reveals its potential as a viable, eco-friendly and sustainable development option. This option calls for reorienting and harnessing its potential for urban employment, for economic growth and even more importantly, for

living in harmony with nature — a fact that is rooted in the being of Nakuru.

However, during our discussions with the municipal officers it was admitted that, apart from knowing that urban agriculture is everywhere in the town, there is no systematic knowledge of the phenomenon, because a study on this issue had never been done in the town. The major objective of the underlying report is therefore to (at least partly) fill this gap.

## Chapter 3

# Research methods

### SAMPLING PROCEDURE

In order to obtain an overall view of urban agriculture in Nakuru town, a general survey was carried out in June-July 1999. To get a representative sample of 600 households of the Nakuru population, the 15 clusters of the Kenyan Central Bureau of Statistics were used. Together, the clusters count about 1,400 households; hence, from each cluster a 43% (600 out of 1400) random sample was drawn (Table 3.1).

Table 3.1 Household sample

| cluster name        | estate name | housing density* | number of households drawn | number of households covered |
|---------------------|-------------|------------------|----------------------------|------------------------------|
| 1 Lake View         | Lake View   | medium           | 43                         | 42                           |
| 2 Langalanga        | Langalanga  | medium           | 45                         | 43                           |
| 3 Flamingo I        | Flamingo I  | medium           | 37                         | 37                           |
| 4 Ziwani            | Ziwani      | medium           | 42                         | 43                           |
| 5 Milimani          | Milimani    | low              | 9                          | 8                            |
| 6 Bangladesh        | Bangladesh  | medium           | 39                         | 39                           |
| 7 London/Menengai   | Menengai    | medium           | 26                         | 28                           |
| 8 Kabachia          | Kabachia    | medium           | 42                         | 39                           |
| 9 Lanet             | Lanet       | medium           | 56                         | 56                           |
| 10 Mwariki          | Mwariki     | high             | 56                         | 55                           |
| 11 Rhonda/Sewage    | Kwa Rhonda  | medium           | 25                         | 23                           |
| 12 Rhonda/Pondamali | Kwa Rhonda  | high             | 46                         | 48                           |
| 13 Rhonda/Weavers   | Kwa Rhonda  | high             | 39                         | 38                           |
| 14 Rhonda/Muslim    | Kwa Rhonda  | high             | 34                         | 33                           |
| 15 Rhonda/Kaptembwa | Kwa Rhonda  | high             | 61                         | 62                           |
| total               |             |                  | 600                        | 594                          |

\* Based on own observations in the field. The main criterion used is the amount of space which can potentially be used for agricultural purposes relative to the total surface of the residential plots in a certain cluster. Hence, the densities in this table do not fully overlap with the ones given by MCN 2000 as indicated on Figure 3.6 (see Map 2.4).

### Map 3.1: Distribution of the research clusters

In the end, 594 households were covered. The geographical distribution of the clusters is shown on Map 3.1.

It is important to note that the 15 CBS clusters cover the built-up area of Nakuru municipality. There are no clusters in the peri-urban areas i.e. between the (more or less densely) built-up area and the boundary of the municipality. The latter are former rural areas which were incorporated into the municipality after the boundary extensions of 1972 and 1992 and have still a predominantly agricultural character: the large-farms area in the west, the small-farms area in the southwest and the medium-farms area in the far east. The 'white square' in the far east is a military area (the Lanet Army Barracks). In short, we deal in this report with urban farming in the strict sense (see Chapter 1) by excluding the peri-urban areas.

During the fieldwork, 12 assistants and two supervisors managed to cover the almost 600 households in about one month time. Half of the assistants were CBS enumerators, kindly given at our disposal by the Provincial Statistical Officer. The assistants worked in two teams; each team was led by a very experienced CBS enumerator. The entire survey was supervised by the co-researcher assisted by a local supervisor.

#### PROBLEMS ENCOUNTERED WITH THE FIELDWORK

The major problems encountered in the field include:

- Outright refusal by some households to respond to the questions. This was mainly due to the fact that by the time of the survey, there was another general survey on HIV/AIDS being carried out in the same clusters. Due to the sensitive nature of those questions, most households, especially the ones in high-density areas, were suffering from 'questionnaire fatigue'. They were, therefore, not ready to take any more questions from us thinking that we had the same types of questions. This at one time led to the households playing a 'hide and seek' game with the assistants, especially in one of the clusters in Kwa Rhonda. This refusal problem was solved by 'replacing' the outright refusal households, but only after more than three attempts of persuasion.
- In some instances, and more specifically in one of the other clusters in Kwa Rhonda, almost all the houses were vacant due to inter- and intra-estate mobility. Apparently, the landlord had increased the monthly rent of the houses the month

before the survey. Most tenants had, therefore, moved out to 'affordable' dwellings in the neighbourhood not known to the assistants. This problem was solved by selecting another structure within or just outside the CBS cluster in the case of the vacant houses or by selecting another household within the cluster to be used as 'replacement'.

- There were also a number of 'call-backs' for the household heads who were working during normal working hours in the week. This forced the assistants to go back to the households late in the evening and during weekends. This problem occurred particularly in the low-density/high-income cluster of Milimani. It was dealt with by making appointments (call-backs) to the convenience of the household head. In case of more than three call-backs the household was replaced.
- In some low and middle-density clusters, there was a problem of suspicion leading to reluctance by some of the respondents to cooperate. This problem was overcome through careful introduction and statement of the purpose of the research and asking whether the respondent had any questions, concerns or reservations about the survey. The CBS enumerators were very helpful in this case since most of the households knew them personally.

#### SOURCES AND METHODS OF DATA COLLECTION

In this survey both primary and secondary sources and methods of data collection were employed. Primary information was gathered using a largely pre-coded questionnaire. Information was collected on:

- demographical characteristics of the household;

- migration history of the head of the household and the spouse;
- economic activities of all household members in 1998;
- crop cultivation in Nakuru town;
- livestock keeping in Nakuru town;
- agricultural activities outside Nakuru town; and
- the general food security situation. The complete questionnaire is shown in Appendix 6.

#### DATA ANALYSIS

The process of data analysis involved (1) editing the questionnaires for the purposes of checking on completeness, clarity and consistency in answering the research questions; (2) coding the data; (3) data entry into the computer; and (4) data analysis. The Statistical Package for Social Sciences (SPSS) was used for data analysis. Both quantitative and qualitative statistical techniques were used to analyse the field

survey data.

#### THE RESPONDENTS

Table 3.2 shows some characteristics of the respondents. The large majority of them were either the head of the household him/herself or the spouse. Since the spouse is always a woman, the majority, i.e. over two-thirds, of the respondents were women. In 78 of the 594 households, another person was the one who was interviewed. In all cases except one this was another family member, mostly a brother or sister of the household head or a grown-up child. The majority of the respondents were between 20 and 40 years of age.

Table 3.2 Characteristics of the respondents (%; N=594)

|                            |                     |      |
|----------------------------|---------------------|------|
| relation to household head | household head      | 40.2 |
|                            | spouse              | 46.6 |
|                            | brother/sister      | 5.4  |
|                            | child (adult)       | 6.7  |
|                            | niece/nephew/cousin | 0.8  |
|                            | workmate            | 0.2  |
|                            | Total               | 100  |
| sex                        | male                | 30.6 |
|                            | female              | 69.4 |
|                            | Total               | 100  |
| age (years)                | <20                 | 15.5 |
|                            | 20-29               | 39.9 |
|                            | 30-39               | 25.1 |
|                            | 40-49               | 11.4 |
|                            | 50+                 | 8.1  |
|                            | Total               | 100  |

#### THE RESEARCH POPULATION

The total research population consisted of 2,369 persons. Of these, 51% were male and 49% female. One-quarter of the population were children under ten years of age, another 23% was between ten and twenty years. The elderly, i.e. of fifty years and above, formed 4.4% of the population. One-quarter were the household heads, another 17% were spouses. Almost half (48%) were children.

Some basic characteristics of the 594 sampled households are shown in Table 3.3.

Over half of the households consisted of two to four persons, with an average household size of exactly four (2,369 persons divided by 594 households). One out of each nine households consisted of one person only, while another 7% could be classified as 'large', with at least eight members.

The large majority (over 80%) of the households fall in the category of low-income households, at least in terms of monthly cash income during the time when the survey was held and according to the respondent's estimation and willingness to provide the right answer. Over half (53%) of the households could be categorised as 'very poor'. The well-to-do households formed a small minority (6%).

Table 3.3 Characteristics of the sampled households (%)

|                                                   |               |      |
|---------------------------------------------------|---------------|------|
| household size (members)<br>(N=594)               | 1             | 11.3 |
|                                                   | 2-4           | 53.7 |
|                                                   | 5-7           | 27.9 |
|                                                   | 8+            | 7.1  |
|                                                   | Total         | 100  |
| monthly cash income (Ksh)<br>(N=583)              | up to 5,000   | 53.2 |
|                                                   | 5,001-10,000  | 28.6 |
|                                                   | 10,001-20,000 | 12.7 |
|                                                   | >20,000       | 5.5  |
|                                                   | Total         | 100  |
| sex of household head<br>(N=594)                  | male          | 80.3 |
|                                                   | female        | 19.7 |
|                                                   | Total         | 100  |
| age of household head<br>(N=577)                  | <20           | 2.3  |
|                                                   | 20-29         | 29.3 |
|                                                   | 30-39         | 35.0 |
|                                                   | 40-49         | 20.1 |
|                                                   | 50-59         | 10.4 |
|                                                   | 60+           | 2.9  |
|                                                   | Total         | 100  |
| ethnic background of<br>household head<br>(N=593) | Kikuyu        | 44.0 |
|                                                   | Luo           | 19.9 |
|                                                   | Luhya         | 17.5 |
|                                                   | Kalenjin      | 5.7  |
|                                                   | Kisii         | 5.4  |
|                                                   | Kamba         | 3.9  |
|                                                   | other         | 3.5  |
|                                                   | Total         | 100  |

One-fifth of the households were headed by a woman (Table 3.3). We can add here that female-headed households are much more common among the low-income households than among the better-off ones: 69% of the female-headed households appeared to be very poor (i.e. with a monthly cash income of less than 5,000 Kenyan shillings), against 49% of the male-headed households.

The age distribution of the household heads shows the usual spread, with the large majority being between twenty and fifty years of age (Table 3.3). The largest single age group is the one between 30 and 39 years. Very few of the household heads were either younger than twenty or older than sixty. The oldest household head was 77 years of age.

As far as the ethnic background of the household heads is concerned, Table 3.3 shows that by far the largest group were the Kikuyus (44%), at some distance followed by Luos (20%) and Luhyas (18%). Kalenjins, Kisiis and Kambas formed fairly small minorities among the household heads, and although many other ethnic groups were represented in the sample, their numbers were negligible.

Finally, three-quarters of the household heads were married, the large majority of them monogamously. Almost 20% were not married and another 7% divorced, separated or widowed. Most of the household heads had a fairly good level of education, i.e. either primary school (30%) or secondary school (46%). Less than 3% had followed no education at all. Most household heads were either regularly employed (41%) or self-employed (42%). Thirteen percent had only a temporary job or performed casual labour. Few (2%) stated to be unemployed.

#### NUMBER OF FARMING HOUSEHOLDS IN NAKURU

Table 3.4 shows the numbers of households in Nakuru town doing some kind of farming: the "urban farmers" of Nakuru town. A distinction has been made between area (i.e. either in town or in the rural area or both) and between the type of farming (either crop cultivation or livestock keeping). Column 1 shows that 447 households were in one way or another performing farming activities in 1998. This is 75% of the total population. Almost all of these households cultivated crops, many of them mixing this with livestock keeping. Only a few households (16) kept livestock with

Table 3.4 Numbers of households practicing farming by area and type of farming

|                            | total | urban | rural |
|----------------------------|-------|-------|-------|
| farming                    | 447   | 209   | 366   |
| of which: crop cultivation | 431   | 160   | 361   |
| livestock keeping          | 299   | 121   | 222   |

out growing crops. The table also shows that *rural* farming is more common than farming in town: 366 households farmed in the rural areas and 209 households in Nakuru town.

## Chapter 4

# The importance of farming in town

Table 4.1 presents the percentages of the Nakuru population who, in 1998, were farming in town (in the strict sense, i.e. practicing any farming activity in the built-up area of the town), cultivating crops in town, or keeping livestock in town. The right-hand column offers an estimation of the total number of households in Nakuru falling in each of these three categories. The table shows that over one-third of the Nakuru population can be labeled as 'farmer in town'. In absolute numbers, this percentage amounts to about 25,000 households.

Table 4.1 Percentages of households farming in town, 1998

|                           | percentage<br>in survey<br>(N=594) | estimated number<br>of households<br>in Nakuru town* |
|---------------------------|------------------------------------|------------------------------------------------------|
| farming in town           | 35.2                               | 25,000                                               |
| cultivating crops in town | 26.9                               | 19,000                                               |
| keeping livestock in town | 20.4                               | 14,000                                               |

\* Based on an estimated total number of households in Nakuru Municipality of 70,000 in 1999, calculated as follows. The 1989 population of the Municipality was 164,000 and the number of households 46,741 (Kenya 1997). Hence, the average household size in 1989 was 3.5. The 1999 population was 239,000 (Kenya 2000). With an unchanged average household size, the number of households in 1999 would be about 68,000. Assuming, however, that the average household size has decreased to 3.4 (which may be a conservative estimation), the number of households then becomes about 70,000.

### CROPS AND LIVESTOCK

Three-quarters of the urban farmers — just over one-quarter of the Nakuru population — were crop cultivators in 1998. Taken together, these people cultivated 182 plots, or 1.1 plot per household. The average plot size was 964 square metres, i.e. almost 0.1 hectare or 0.25 acres. This means that in 1998, roughly 5,200 acres of land was under crops (i.e. in the built-up area!). Plot sizes differ substantially,

however: on the one hand, 30% is smaller than 50 square metres, while another third is bigger than 1,000 square metres.

The most common crops are maize (on 62% of the plots), kales or *sukuma wiki* (61%), beans (56%), onions (25%), spinach (20%), tomatoes (19%), Irish potatoes (18%), cowpeas (16%), bananas (16%) and a local vegetable called *saget* (11%). A cautious estimation learns that some 6 million kg of crops were produced in the built-up area of Nakuru in 1998 (see Chapter 6).

One-fifth of the Nakuru population kept livestock in 1998. Livestock includes not only cattle, goats and sheep, but also smaller animals like chicken, ducks, rabbits, doves and turkeys. The most important types were chicken (17.2% of the households), cattle (4.4%), goats (2.2%), ducks (1.7%) and sheep (1.3%). In 1998, an estimated 20,000 larger animals were kept in the built-up area of Nakuru town and over 300,000 smaller livestock (see Chapter 7).

#### IMPORTANCE FOR THE PEOPLE INVOLVED

The importance of urban farming in Nakuru can also be measured in a more subjective way, namely by the relevance attached to the activity by the people concerned. First, both the crop cultivators and the livestock keepers were asked for what reason(s) they practiced this type of activity. For the large majority of both crop cultivators and livestock keepers, the extra food produced was mentioned not only as one of the reasons but also as the main reason (Table 4.2). However, for one-quarter

Table 4.2 Reasons for growing crops and keeping livestock in town (%)

|                     | <u>crop cultivation (N=160)</u> |                 | <u>livestock keeping (N=121)</u> |                 |
|---------------------|---------------------------------|-----------------|----------------------------------|-----------------|
|                     | reasons<br>(total>100%)         | major<br>reason | reasons<br>(total>100%)          | major<br>reason |
| needed food         | 97.5                            | 90.0            | 92.6                             | 73.6            |
| needed income       | 15.0                            | 3.8             | 32.2                             | 14.9            |
| to diversify income | 9.4                             | 3.8             | 23.1                             | 10.7            |
| hobby/custom        | 9.4                             | 3.8             | 9.9                              | 0.8             |
| other reasons       | 2.5                             | -.              | 0.8                              | -.              |
| total               |                                 | 100             |                                  | 100             |

of the livestock keepers the additional income obtained with this activity was said to be the major reason. For some, though a small minority, urban farming is more a kind of hobby.

There were hardly any differences between the income groups as far as the reasons for crop cultivation and livestock keeping are concerned. If the lowest-income and the highest-income group are compared, the percentages of households mentioning the need of food were very high in both groups. There were only small differences regarding the need for additional income as the major reason, a reason that was mentioned by 12% of the lowest-income crop cultivators and 26% of the livestock keepers, compared with none of the highest-income crop cultivators and 8% of the livestock keepers, respectively. Moreover, those mentioning 'hobby' were almost all from the highest-income category.

In answer to the question how much urban crop cultivation contributed to the household food consumption, 42% of the crop cultivators in Nakuru said that it constituted half or more of the food they consumed. For another 51% it added less than half to a small portion. Only a small minority stated that the urban crop production was of negligible importance in terms of household food consumption. Based on the production figures, it was possible to calculate the actual contribution to the energy needs of the Nakuru population. It was found that the total amount of crops produced constitutes about 8% of the total energy requirements of the entire population and that it covers about 30% of the energy needs of the urban crop cultivators themselves (for details, see Chapter 6 and Appendix 3).

As could be expected, the contribution of urban crop cultivation to household food consumption — as perceived by the respondents — is larger among low-income households than among high-income households. For 60% of the poorest crop cultivators (i.e. with a monthly household income of Ksh. 5,000 or less), the self-produced crops constituted at least half of the food consumed in the household. This applied to 23% of the highest income group (over Ksh. 20,000/month), with the middle categories (Ksh. 5,001-10,000 and Ksh. 10,001-20,000) in between.

Both crop cultivators and livestock keepers were asked about the general importance

of these respective activities (Table 4.3). For the large majorities, urban farming forms at least an additional food and/or income source. For about a quarter it is a major source. Some even stated that they could not survive without it, while, on the other hand, very few said the reverse.

Table 4.3 Importance of urban farming activities for crop cultivators and livestock keepers (%)

|                                      | urban crop<br>cultivators<br>(N=160) | urban live-<br>stock keepers<br>(N=121) |
|--------------------------------------|--------------------------------------|-----------------------------------------|
| could not survive without it         | 6.9                                  | 2.5                                     |
| major food and/or income source      | 21.2                                 | 28.1                                    |
| additional food and/or income source | 75.6                                 | 86.8                                    |
| could do without it                  | 3.1                                  | 3.3                                     |

Note: totals add up to over 100%.

The figures presented in Table 4.3 show no marked differences for the four income groups. For poor and rich households alike, urban farming activities are both a food and an income source. Only in the lowest income group, the percentage of households stating that they "could not do without" urban crop cultivation was higher (14.0%) than among the other groups (4.5%).

Crop cultivation is more of a subsistence nature than livestock keeping. Only 11% of the crop cultivators indicated that this activity was a major or additional income source, against 37% for the livestock keepers. There are no differences among the income groups in this respect.

## Chapter 5

# The geography of farming in town

Farming is done everywhere within the boundaries of Nakuru municipality. As mentioned in Chapter 2, in the peri-urban zone — i.e. the zone between the built-up areas and the town boundary — farming is the dominant economic activity, either on large farms (west and northwest) or on smaller farms (southwest and southeast). But also in the built-up areas, farming activities are all around. Crops are not only being cultivated in the people's compounds but also along roads, along the railways, under powerlines, as well as on each piece of vacant land. Livestock, too, is kept in compounds, but is also seen freely roaming around on pieces of open space, including the streets.

### HOUSING DENSITIES AND URBAN FARMING

Table 5.1 presents the percentages of farmers in town, crop cultivators in town and livestock keepers in town by housing density (the percentages by research cluster are presented in Appendix 1, Table A1.1). In general, there are more urban farmers as housing density is lower. Of the eight respondents in the low-density area, Milimani, seven were urban farmers and all of these except one were both crop cultivators and livestock keepers. Medium-density areas like Kabachia and London/Menengai also have high percentages of urban farmers, 82% and 71%, respectively. In the high-

Table 5.1 Farmers in town by housing density (%)

|                     | high<br>density<br>(236) | medium<br>density<br>(350) | low<br>density<br>(8) | total<br>(594) |
|---------------------|--------------------------|----------------------------|-----------------------|----------------|
| (N=)                |                          |                            |                       |                |
| urban farmers       | 24.2                     | 41.4                       | 87.5                  | 35.2           |
| - crop cultivators  | 12.7                     | 35.1                       | 87.5                  | 26.9           |
| - livestock keepers | 16.1                     | 22.0                       | 75.0                  | 20.4           |

density areas of Rhonda Muslim and Rhonda Kaptembwa, however, only about 15% of the households are engaged in some kind of agriculture in town. However, the reverse relationship between housing density and numbers of urban farmers applies particularly to crop cultivation. Livestock is more evenly spread over the estates, not only small livestock but also larger animals. Keeping one or a few animals requires relatively little space, particularly if kept in zero-grazing or when the animals are roaming around in the streets.

#### CHARACTERISTICS OF URBAN PLOTS

Table 5.2 presents information on various characteristics of the urban *shambas* (details are given in Appendix 1, Table A1.2). Most of the 180 plots used for crop cultivation were located in the farmers' own compounds (61%). This is the category of 'on-plot' farmers. The rest of the plots were located elsewhere ('off-plot'): in the respondent's estate (17%), along a railway (8%), in another estate (6%), along a road (4%), or in various other locations (5%) such as along a river, under a power line, next to a cemetery, next to a park, next to a sewage or in a school compound. The percentage of plots in one's own compound is somewhat higher in the estates with lower densities, Milimani having the highest percentage (100%). Nevertheless, over half of the plots in the high-density areas were also in the people's compounds.

Table 5.2 Characteristics of urban plots by housing density (%)\*

|                             | (N=)                | high<br>density<br>(35) | medium<br>density<br>(138) | low<br>density<br>(7) | total<br>(180) |
|-----------------------------|---------------------|-------------------------|----------------------------|-----------------------|----------------|
| location                    | in own compound     | 52.9                    | 60.4                       | 100.0                 | 60.6           |
|                             | within estate       | 29.4                    | 14.2                       | -.                    | 16.6           |
| distance to plot            | <10 minutes walking | 65.7                    | 69.6                       | 100.0                 | 70.0           |
| cultivate plot<br>since     | before 1990         | 28.6                    | 23.1                       | -.                    | 23.3           |
|                             | after 1994          | 57.1                    | 49.3                       | 57.1                  | 51.1           |
| plot size (m <sup>2</sup> ) | <100                | 22.9                    | 44.9                       | 16.7                  | 34.1           |
|                             | 1000+               | 37.1                    | 28.3                       | 83.3                  | 31.8           |
| ownership<br>of plot (%)    | own land            | 57.1                    | 25.5                       | 57.1                  | 33.0           |
|                             | landlord            | 28.6                    | 50.4                       | 42.9                  | 45.8           |
|                             | government          | 2.9                     | 17.5                       | -.                    | 14.0           |

\* For more details, see Appendix 1, Table A1.2.

The ten plots of the households in Ziwani (medium density) were all located outside the estate itself, because the landlord (the railway company) does not allow farming inside the estate, despite there being space to do so. The plots are located along the railway to Nairobi, a zone to which the residents of this railway estate have easier access than others. Because the estate is located at some distance south of the railway itself, Ziwani is also the only area where the majority of the plots were located at a distance of more than half-an-hour walking from the house. In most other areas, the large majority of the plots were within a distance of ten minutes walking (Table 5.2), except for Flamingo I (medium density), where one-third of the plots were located at a distance of more than one hour walking. This has to do with the back-to-back construction of the houses and the resulting absence of backyards.

Crop cultivation in Nakuru at the present scale seems to be a rather recent phenomenon. Only 13 of the 180 plots encountered in 1999 were already in cultivation before 1980 (Appendix 1, Table A1.2). Another 16% were taken into cultivation during the 1980s. So, the majority (77%) of the plots had been taken into use for growing crops since 1990 and about half even since 1995 (Table 5.2). This time pattern can be seen in all three density categories. Only in the low-density area of Milimani, none of the seven plots there had been in use for growing crops before 1990.

As mentioned in the previous chapter, the average plot size was 964 square metres. The smallest plots encountered were a few of just one square metre. The largest one was a plot in Lanet which measured 16,000 square metres (1.6 hectares). There is no clear relationship between plot sizes on the one hand and housing density on the other, although it is not surprising that six of the seven plots in Milimani are bigger than 1,000 square metres (Table 5.2). The relatively high percentage of small plots (less than 100 square metres) in the medium density areas may be explained by the fact that, compared with the households in the high-density areas, more plots there are located within the households' own compound.

Equally, there appeared to be no relationship between plot size and income class. The distribution of plot sizes was about the same for the four income categories. In all income categories, very small plots with a size of less than 50 square metres could be found (be it that somewhat more among the very-low-income households:

38% vs. 27% in the combined other categories) and the same applies to the larger plots of more than 1,000 square metres.

One-third of the plots used for crop cultivation were owned by the cultivators themselves (Table 5.2). Another 46% of the plots were owned by a landlord, while 14% of the plots were on government land. It is conspicuous that the percentage of 'own land' in the high-density areas is much higher than in the medium-density areas and that it is the other way around with 'landlord' and 'government'. Nearly all residential land in the built-up area of Nakuru town is government land which is leased out to the residents. It seems that the inhabitants of the lower-density estates (with usually higher levels of education) are more aware that they are not the actual owners of the land than those living in the higher-density estates. The large majority of the plots are compounds of rented houses. This is confirmed by the fact that hardly anybody pays rent for the plot.

## Chapter 6

# Crop cultivation in town

### CROP PRODUCTION

A wide range of crops is being cultivated in Nakuru. Appendix 2 offers a full list of all crops cultivated by the 160 urban crop cultivators in the survey. Both from Appendix 2 and from looking around in the field it is clear that mixed cropping is very common. In a few cases, ten or more different crops were found on one single plot. On about a dozen plots, only one crop was cultivated.

The average number of crops cultivated per household in 1998 was 4.3. Crop cultivators in the highest income class (more than Ksh. 20,000/month) grew more crops (6.7) than those in the other income classes. This is to some extent related to plot size: although the size distribution of the plots was about the same in each of the four income categories, the very small plots — i.e. less than 50 square metres — were more common among the lowest-income group and less common among the highest-income category (38% and 20%, respectively). A small minority (8%) cultivated just one crop. About two-thirds (64%) of the crop cultivators had planted two to five crops, another quarter (26%) between six and ten crops.

Table 6.1 lists the ten most important crops, i.e. the crops which were cultivated by at least 10% of the crop cultivators (which are the same ten crops as the top-ten in Appendix 2 which are listed according to presence on plots). Kales (*sukuma wiki*), maize and beans are the dominant crops in Nakuru town, with over half of the cultivators growing these plants (column 1). Onions, spinach, tomatoes and Irish potatoes are cultivated by 20 to 30% of the cultivators and cowpeas, bananas and spider plant (*saget*) by less than 20%.

At first sight, the harvests of the various crops (in kilograms; Table 6.1, column 3) seem to be quite modest. However, when looking at for instance maize, the 101 households cultivating this crop harvested in 1998 about 22,600 kg, which amounts to some 2.7 million kg for the built-up area of Nakuru as a whole (based on the assumption that there were about 70,000 households in 1999; see footnote with Table 4.1). Likewise, the Nakuru crop cultivators produced about 1.1 million kg of kales, 0.8 million kg of beans, 140 tons of onions, 390 tons of spinach, 60 tons of tomatoes, 330 tons of Irish potatoes, 220 tons of cowpeas, 13 tons of bananas and 70 tons of spider plant. If the other 30 less important crops (Appendix 2) would also be included, we (carefully) estimate that the total crop production in Nakuru town in a normal year amounts to about 6 million kg. And if the peri-urban areas of Nakuru town were included, this figure would even be higher.

Crop harvests differ substantially between household income classes. Taking the ten crops of Table 6.1 together, the households in the high-income category realised the highest average harvest (594 kg/household), followed by the lowest income category (393 kg/household) and the two middle-income categories (together 224 kg/house

Table 6.1 Major crops in town

| crop type                     | (1)<br>% households<br>cultivating<br>(N=160) | (2)<br>N | (3)<br>average amount<br>harvested<br>(in kgs)* | (4)<br>percentage<br>self-consumed** |
|-------------------------------|-----------------------------------------------|----------|-------------------------------------------------|--------------------------------------|
| kales ( <i>sukuma wiki</i> )  | 68.1                                          | 109      | 84                                              | 75                                   |
| maize                         | 63.1                                          | 101      | 224                                             | 77                                   |
| beans                         | 58.8                                          | 94       | 75                                              | 77                                   |
| onions                        | 28.1                                          | 45       | 26                                              | 78                                   |
| spinach                       | 22.5                                          | 36       | 92                                              | 62                                   |
| tomatoes                      | 21.9                                          | 35       | 15                                              | 78                                   |
| Irish potatoes                | 20.0                                          | 32       | 88                                              | 82                                   |
| cowpeas                       | 17.5                                          | 28       | 67                                              | 70                                   |
| bananas                       | 16.9                                          | 27       | 4                                               | 62                                   |
| spider plant ( <i>saget</i> ) | 11.9                                          | 19       | 33                                              | 68                                   |

\* Only households cultivating that crop (see column 2). During the survey, harvests were given in many different units. In order to make the figures unequivocal and hence comparable, all units were translated into kilograms. As this method implies an element of speculation, the presented average harvests have to be considered as indications.

\*\* For calculation, see Appendix 3.

hold). These differences cannot be explained by differences in plot size (see Chapter 5). Hence, it is likely to be related to types of inputs used and the factor labour (see below).

Crop production is mainly for self-consumption. Of all the ten main crops in Table 6.1, on average about 75% of the harvest was consumed in the producers' households. There are no differences between the income categories in this respect. Despite these high levels of self-consumption, it is important to realise that roughly about one-quarter of all the produce (i.e. 1.5 million kilograms in the town as a whole) is sold, which means that many other households may benefit from the urban food production as well by obtaining it at prices which are likely to be lower than the normal market prices.

It is possible to assess the contribution of the produced food to the energy requirements of the producers themselves and to the Nakuru population as a whole (be it that because of various assumptions on which such calculations are based, these figures can be no more than cautious indications). The outcome of the calculations (which are presented in Appendix 3) is that in 1998 the total crop production (in the built-up area) contributed 8% to the energy requirements of the Nakuru population as a whole, but about 30% to the energy requirements of the producers (or 22% with the assumption that one-quarter of the produce was sold).

#### INPUTS FOR CROP PRODUCTION

Table 6.2 shows the percentages of crop-cultivating households using certain inputs. Ten respondents said they used no inputs at all. Almost all crop cultivators used at least one type of fertilizer. Most fertilizer was of the 'traditional' (i.e. organic) type: manure, crop residues, urban waste and (in two cases) ash. The manure was either from one's own farm (mixed farming in town) or from a neighbour. Crop residues were almost always from the farmer's own (urban) farm. Chemical fertilizer was used by about one-third of the crop cultivators. The use of (chemical) pesticides and insecticides was not very widespread: also by about one-third of the cultivators. Most farmers used local (traditional) seeds and seedlings, although more than half used improved materials as well. Finally, irrigation was practiced by almost half of the cultivators. All of them except two obtained the water from a tap (even though

the

Table 6.2 Inputs for crop cultivation in town (% of households; N=160)

| type of input              | %    | type of input            | %    |
|----------------------------|------|--------------------------|------|
| no inputs                  | 6.3  | chemical pesticides      | 29.4 |
|                            |      | chemical insecticides    | 8.8  |
| chemical fertilizer        | 35.6 |                          |      |
| manure as fertilizer       | 53.1 | local seeds/seedlings    | 70.6 |
| crop residue as fertilizer | 35.0 | improved seeds/seedlings | 57.5 |
| urban waste as fertilizer  | 3.1  |                          |      |
| ash as fertilizer          | 1.3  | irrigation               | 44.4 |

use of domestic water for irrigation purposes is illegal). One of latter two used sewage water for irrigation and the other cattle urine.

One might expect cultivators in the higher income categories to use more modern inputs (chemicals, improved seeds/seedlings, irrigation) than the cultivators with lower incomes, as modern inputs tend to be more expensive than traditional inputs. This appeared to be only partly the case. If the two extremes of the four income categories — the 'poor' with a monthly income of less than Ksh. 5,000 and the 'rich' with a monthly income of over Ksh. 20,000 — are compared, the poor tend to use more chemical fertilizer (42% versus 29%), while the rich use more traditional/organic fertilizer (manure: 65% vs. 42%; crop residues: 59% vs. 21%; urban waste: 12% vs. 0%). As for chemical pesticides and insecticides, there are no differences between the two income classes. Improved seeds/seedlings are more commonly used by the rich (82% vs. 54%) and the same applies to irrigation (71% vs. 23%). In all cases, the explanation has to be sought in a combination of availability, costs and perceived necessity.

Only ten (6.3%) of the 160 crop cultivators had received technical assistance in 1998. Three of them had been visited by an extension officer and one of them by an officer of the urban agriculture programme of the Catholic Diocese of Nakuru. The others had received some assistance from neighbours and/or relatives.

In almost all cases, it is either the household head (37.5%) or the spouse of the head (50.6%) who is responsible for the crop cultivation. Among the poor households, it is much more often the head him/herself who is responsible than among the rich households (51% vs. 12%). Spouses are responsible to the same degrees in all income categories. In 18 cases, it was another household member who took care of the crop production, such as a brother or sister of the household head, a child or a houseboy or girl. In two cases, a hired labourer was taking care of the crop production. Usually, the crop cultivation is not a full-time job for the person involved, though 14% of the crop cultivators said it was. This applies more often to the lowest income category than to the other three income classes (26% vs. 11%). During peak periods, labour is sometimes hired. This was the case among 27.5% of the cultivators and is more common as household income is higher (for instance, 19% among the poor and 41% among the rich).

#### PROBLEMS WITH CROP PRODUCTION

Table 6.3 presents the most frequently mentioned problems related to crop cultivation in Nakuru town as perceived by the cultivators (see Appendix 2, Table A2.2 for a complete list of problems mentioned by the crop cultivators). The respondents were asked to mention any problems they had encountered in 1998 (middle column) as well as the main problem (right-hand column). Although a wide range of problems was indeed mentioned (see Table A2.2), it is conspicuous that one-sixth of the cultivators said that they had had no problem. Many problems are not specific to the urban setting in which the crop cultivation takes place; examples are pests/insects, destruction by animals, inadequate rainfall, diseases, poor soils, etc. However, the most frequently mentioned constraint is typically urban: theft of crops. This is a major problem in many other studies as well. Other 'urban' constraints such as harassment and lack of space/land were mentioned by only a few respondents. The same applies to such problems as lack of inputs, lack of capital and lack of labour. Three respondents mentioned a very specific problem (grouped under 'other problems' in Table A2.2), namely poor seasonal timing, a sewage burst (apparently spoiling the crops) and too much rainfall (where, on the other hand, 56 others complained of inadequate rainfall). The answers to the question which of the problems was seen as the major problem (right-hand column in Table 6.3) are comparable with all the problems mentioned.

Table 6.3 Most frequently mentioned problems with crop cultivation in town  
(%; N=160)\*

|                              | mentioned<br>as a<br>problem | mentioned<br>as the main<br>problem |
|------------------------------|------------------------------|-------------------------------------|
| no problem                   | 16.3                         | 16.3                                |
| theft of crops               | 36.6                         | 24.4                                |
| inadequate rainfall          | 35.0                         | 24.4                                |
| destruction by animals       | 23.8                         | 10.0                                |
| pests/insects                | 22.5                         | 8.8                                 |
| lack of water for irrigation | 12.5                         | 9.4                                 |
| diseases                     | 9.4                          | 2.5                                 |
| lack of inputs/capital       | 6.9                          | 1.9                                 |

\* For *all* mentioned problems, see Appendix 2, Table A2.2.

Although there are no substantial differences between the income categories concerning the problems with crop production, three differences should be mentioned. The rich suffer less from theft than the poor (24% vs. 44%) and also less from destruction by animals (12% vs. 28%). This is undoubtedly related to the fact that the rich are more often able to grow crops within their own compounds. On the other hand, the poor complained less of lack of water for irrigation (5% vs. 24%), which is likely to be related to the factors availability and perceived necessity: for many poor households, tap water is simply not an option, so it is also not seen as a problem.

All types of problems occur in all estates, so there are no clear differences according to housing density. There is one exception, however: in the low-density area of Milimani 'theft' was not mentioned at all as a problem, but for about one-quarter of the crop cultivators in the medium- en high-density areas it was the major problem.

## Chapter 7

# Livestock keeping in town

### ANIMAL PRODUCTION

As mentioned earlier, one-fifth of the Nakuru households can be classified as livestock keepers in town. Chicken are by far the most common type of livestock kept by the Nakurians (Table 7.1). The percentages of households keeping larger animals like cattle, sheep, goats and pigs do not exceed 5%, while smaller livestock like ducks, rabbits, doves and turkeys are generally even less common. Nevertheless, we can roughly estimate the numbers of livestock in Nakuru town by the end of 1998 to be 12,000 head of cattle, 6,600 sheep, 6,800 goats, 360,000 chicken, 13,500 ducks, 3,000 rabbits, 1,400 doves and 600 turkeys.<sup>3</sup> These figures are higher than those provided by the local branch of the Ministry of Agriculture (see Obudho & Foeken 1998, pp. 14-15), except the number of cattle which were estimated at 25,000 head by the Ministry. The latter can most likely be explained by the fact that the figures of the Ministry are based on *all* farmers within town, i.e. including those in the peri-urban zone. Nevertheless, for the same reason it is surprising that all other figures of the Ministry are lower than the findings of the survey.

Columns 2 to 6 provide statistics on the livestock 'demography' for each animal type. The first thing that stands out concerns the high death rates (column 5), particularly among the smaller livestock like chicken, ducks and rabbits. Two-thirds of the 121 livestock keepers in Nakuru had experienced at least one death among his or her animals. Secondly, although most animal types are being reared for both self-consumption and selling, some species are more important as an income source than

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<sup>3</sup> Based on number of households keeping certain type of animal (column 1 in Table 7.1), average number of animals (column 2) and the assumption that there were about 70,000 households in Nakuru town in 1999 (see footnote with Table 4.1). So, for example, the number of cattle is calculated as follows: 26 times 3.9 makes 101 head of cattle, times 118 (70,000 divided by 594) makes about 12,000.

Table 7.1 Livestock in 1998: number of households and 'demography' (averages), by animal type

|         | (1)                            |      | (2)  | (3)  | (4)  | (5)  | (6)  |
|---------|--------------------------------|------|------|------|------|------|------|
|         | no. of households<br>abs. (=N) | %    |      |      |      |      |      |
| cattle  | 26                             | 4.4  | 3.9  | 1.1  | 0.5  | 0.5  | 0.3  |
| sheep   | 8                              | 1.3  | 7.0  | 0.8  | 1.8  | 0.4  | 0.3  |
| goats   | 13                             | 2.2  | 4.4  | 1.8  | 0.8  | 2.2  | 2.1  |
| pigs    | 1                              | 0.2  | -.   | -.   | 3.0  | -.   | 3.0  |
| chicken | 102                            | 17.2 | 30.1 | 11.7 | 38.3 | 11.8 | 28.0 |
| ducks   | 10                             | 1.7  | 11.4 | 20.3 | 0.1  | 14.8 | 3.0  |
| rabbits | 3                              | 0.5  | 8.7  | 6.7  | 1.0  | 13.3 | 0.3  |
| doves   | 2                              | 0.3  | 6.0  | 3.0  | 1.0  | 2.0  | 1.0  |
| turkeys | 3                              | 0.5  | 1.7  | -.   | -.   | -.   | -.   |

others. This applies particularly to chicken: many respondents mentioned the typical chicken diseases.

In the rest of the analysis a distinction is made between large livestock and small livestock. Large livestock comprises of cattle, sheep, goats and pigs. Small livestock are chicken, ducks, doves, turkeys and rabbits. It should be kept in mind that 20 of the 121 households with livestock kept both large and small livestock. Thirteen kept only large animals, while 88 had only small livestock.

Figure 7.1 Types of livestock by household income (N)

| type of livestock | household income<br>(Kenyan shillings/month) |                     |
|-------------------|----------------------------------------------|---------------------|
|                   | lower<br>(<10,000)                           | higher<br>(>10,000) |
| large             | 5                                            | 8                   |
| small             | 67                                           | 20                  |
| both              | 11                                           | 9                   |

Figure 1 shows that there is some relationship between the type of animals households keep and the household's income situation. Of the lower-income households, only 19% kept one or more of the larger livestock types. For the higher income group, this figure is 46%. This difference is undoubtedly related to the costs of buying a large animal, cattle in particular. Small livestock is very common among all livestock-keeping households.

#### REARING SYSTEMS

Data on the rearing systems of large and small livestock is presented in Table 7.2. Animals are either kept within the livestock keeper's own compound or being herded outside ('free range') or a combination of the two ('both'). In one-third of the households with large livestock, the animals were only grazing freely in the neighbourhood, while in six others they were partly kept within the compound and partly outside. Small livestock (this concerns largely chicken) were even more left freely roaming around.

Table 7.2 Livestock rearing system by type of livestock (%)

|                                         | N (animals) = | large<br>livestock<br>48 | small<br>livestock<br>120 |
|-----------------------------------------|---------------|--------------------------|---------------------------|
| within own compound                     |               | 54.2                     | 45.0                      |
| free range                              |               | 33.3                     | 53.3                      |
| both within own compound and free range |               | 12.5                     | 1.7                       |
| total                                   |               | 100                      | 100                       |

There were no clear differences between households of different income groups as far as the rearing systems were concerned, although the middle-income households kept their animals more often within their own compounds than the low-income and the high-income groups (55%, 36% and 36%, respectively). This may be explained as follows. Many low-income households have no compound or only a very small one, so free range is the dominant type by necessity. High-income households do have a relatively large compound, but there is also space outside where the animals can freely roam around. Finally, middle-income households also have compounds

(be it smaller) and live in more densely populated areas than the high-income households; hence, their animals are more often kept within the compound.

Large and small livestock differ to some extent as far as the purpose of rearing is concerned. Small livestock is kept first of all for own consumption: almost 60% of those who keep these animals eat most or all of them and another third consumes part of the animals and sells the rest (Table 7.3). Large livestock is less consumed by the keepers themselves: almost three-quarters sells part to all of the animals. Keeping livestock, either large or small, solely for commercial purposes is very rare in Nakuru. There are no clear differences between richer and poorer households as far as the purpose for rearing livestock in town is concerned.

Table 7.3 Purpose of rearing livestock by type of livestock (%)

|                                  | large<br>livestock<br>48 | small<br>livestock<br>120 |
|----------------------------------|--------------------------|---------------------------|
| N (animals) =                    |                          |                           |
| own consumption only             | 20.8                     | 49.2                      |
| mostly own consumption           | 6.3                      | 9.2                       |
| both own consumption and selling | 52.1                     | 31.7                      |
| mostly selling                   | 16.7                     | 7.5                       |
| selling only                     | 4.2                      | 0.8                       |
| hobby/custom                     | .-                       | 1.7                       |
| total                            | 100                      | 100                       |

#### INPUTS FOR ANIMAL PRODUCTION

Table 7.4 shows the types of inputs the Nakuru livestock keepers used for their animals in 1998. For thirteen (11%) of them, livestock keeping seemed to be no serious business, as they had used none of the inputs listed in the table. These are all small-livestock keepers. In general, large livestock gets more attention than small livestock. This applies to all types of inputs, except ethno-veterinary medicines and kitchen remains/food leftovers. Cattle in particular are relatively well taken care of: all cattle holders gave their animals for instance veterinary drugs and feed supplements, while improved breeds/artificial insemination and feeding with crop residues were also very common (for both inputs 77% of the cattle holders).

Table 7.4 Inputs for livestock rearing by type of livestock (%)

|                                         | N (h'holds) = | large<br>livestock<br>33 | small<br>livestock<br>108 |
|-----------------------------------------|---------------|--------------------------|---------------------------|
| no inputs                               |               | -.                       | 10.8                      |
| improved breeds/artificial insemination |               | 41.7                     | 5.8                       |
| health: veterinary drugs                |               | 87.5                     | 33.3                      |
| ethno-veterinary medicines              |               | 8.3                      | 18.3                      |
| feeds: feed supplements                 |               | 68.8                     | 42.5                      |
| urban waste                             |               | 25.0                     | 22.5                      |
| crop residues                           |               | 64.6                     | 37.5                      |
| kitchen remains/food leftovers          |               | -.                       | 22.5                      |

The use of inputs is more common among the richer households than among the poorer ones. For instance, if the two higher-income groups (more than Ksh. 10,000 per month) and the two lower-income groups (up to Ksh. 10,000 per month) are taken together, 81% of the households in the former group used veterinary drugs, against 36% of the households in the latter group; the figures concerning feed supplements were 86% and 48%, respectively, and for the use of improved breeds/artificial insemination 41% and 13%, respectively. These are relatively expensive inputs, which many of the poorer livestock keepers cannot afford.

Thirty per cent of the livestock keepers had received some technical assistance in 1998. Assistance for large livestock was much more common (55%) than for small livestock (25%). Assistance was mostly provided by an extension officer (39%), a neighbour (25%) or a combination of an officer, neighbour and/or relative (17%). Of those households having received assistance, over half (53%) had been visited by an extension officer. On the other hand, if taking all livestock keepers into account, only 19 (16%) had received any assistance from the Ministry of Agriculture. One farmer had received assistance from the urban agriculture programme of the Catholic Diocese of Nakuru. As with the inputs mentioned above, the more well-to-do livestock keepers received more assistance than the lower-income groups. Using the same income classification as above, 54% of the higher-income groups had received some assistance, against 18% of the lower-income groups.

Interestingly, there appeared to be no relationship between receiving technical assistance, on the one hand, and the occurrence of deaths of the animals, on the other. Among those urban livestock keepers who received assistance and those who did not, the percentage of farmers who had experienced one or more death occurrences was equally high (67% and 64%, respectively). This may be due to the fact that vaccination of animals is usually only done *after* a disease outbreak, so that preventive measures are not practiced.

In most cases, it is either the head of the household (38%) or the spouse (56%) who is responsible for rearing the animals. For large livestock the responsibility was equally shared by the head and the spouse (both 42%), but regarding small livestock the spouses formed the majority (57% vs. 37%). The person responsible was in most cases a woman: 69%, which is exactly the same percentage as with crop cultivation. In a few households it was another household member (like a brother or a child of the household head) who looked after the animals, while in five households (4%) a person was employed for this. In 16% of the livestock-keeping households, taking care of the animals was a full-time job for the person involved. Higher-income and lower-income households did not differ in these respects. They did, however, in terms of additional labour being hired. On the whole, 22% of the livestock keepers hired labour in 1998, a figure which was much higher among the two higher-income groups (43%) than among the two lower-income groups (13%). Again, money constraints can explain this difference.

#### PROBLEMS WITH ANIMAL PRODUCTION

Table 7.5 lists the most frequently mentioned problems encountered by the Nakuru livestock keepers (Appendix 5 contains all mentioned problems as well as the main problem mentioned by each respondent). Although 13 of them (11%) said not to have faced any problem, it is clear from the table that the animals' health is by far the greatest concern for the farmers: 72% of them mentioned it as one of the problems and for 57% it was the major problem. Theft, lack of feed and lack of funds/capital were constraints mentioned by at least 10% of the livestock keeping population. 'Nuisance', mentioned by two respondents (Appendix 5), differs from the other constraints in that it refers more to the farmer's neighbour(s) than to him/herself. It

Table 7.5 Most frequently mentioned problems with livestock keeping by type of livestock (%)<sup>\*</sup>

|                             | large<br>livestock<br>33 | small<br>livestock<br>108 | all<br>households<br>121 |
|-----------------------------|--------------------------|---------------------------|--------------------------|
| N (h'holds) =               |                          |                           |                          |
| no problem                  | 9.1                      | 11.1                      | 10.7                     |
| diseases                    | 75.8                     | 71.3                      | 71.9                     |
| theft                       | 24.2                     | 20.4                      | 21.5                     |
| lack of feed                | 27.3                     | 12.0                      | 14.9                     |
| lack of funds/capital       | 15.2                     | 10.2                      | 10.7                     |
| lack of safe drinking water | 24.2                     | 6.5                       | 9.1                      |
| predators                   | 3.0                      | 10.2                      | 9.1                      |
| lack of space               | 3.3                      | 7.4                       | 6.6                      |
| harassment                  | 12.1                     | 2.8                       | 5.8                      |

\* Appendix 5 gives an overview of all mentioned problems as well as the main problem mentioned by each respondent.

probably shows that the two farmers mentioning it had problems with their neighbour(s) because of the latter's problem with the farmer's livestock.

Although, generally speaking, the keepers of large livestock and those of small livestock were rather unanimous regarding the various problems, there are some problems which are more specific to large than to small livestock and vice versa (Table 7.5). Lack of feed and safe drinking water is much more a problem for large livestock keepers, probably simply because these animals eat and drink much more than small animals. Harassment, though not frequently mentioned, is also a constraint specific to large livestock. This may be related to the regulation which says that it is forbidden to let large animals freely roaming around. One problem more frequently mentioned by the small livestock keepers concerned the threat of predators. This is logic, since a chicken or a duck is much more easy to catch by some wild animal (or dog) than a goat or a pig.

Richer and poorer livestock-keeping households showed hardly any difference as far as the various types of constraints are concerned. The two combined higher-income groups complained no less about diseases (84%) and theft (24%) than the two lower-income groups (66% and 20%, respectively). Even lack of funds/capital was equally mentioned between the two groups (11%), although no one in the highest-income

group (i.e. more than Ksh. 20,000/month) complained about this. The only (small) difference between the two income groups was the problem of space, which was mentioned by 10% of the livestock keepers in the lower-income groups but by no one in the higher-income groups.

The same can be said in relation to housing density of the residential area. In general, livestock keepers in the three density categories mentioned the same types of constraints. However, the six livestock keepers in the lowest-density area of Milimani attracted attention by hardly mentioning any problem, except 'diseases' (like all other livestock keepers), 'theft' (one of them) and 'predators' (three). The latter problem is likely to be related to housing density, because predators are rarely seen in densely housed areas: only 8% of the livestock keepers in the medium-density areas and 5% in the high-density areas mentioned this as a problem.

#### WASTE DISPOSAL

One of the major nuisances of livestock keeping in town concerns the animals' waste: how do the Nakuru livestock keepers dispose of it? Table 7.6 provides the answer. One-third of the farmers said to dump part or all of the waste in the street. The large majority of them (92%) dumped the whole lot in that way. However, the table shows that this practice was more common among the keepers of small livestock than among those with large animals. It was also more common among the poorest households (49%), most likely because these people usually have no compound. On the other

Table 7.6 Disposal of the animals' waste by type of livestock (%)<sup>\*</sup>

| N (h'holds) =                                      | large<br>livestock<br>33 | small<br>livestock<br>108 | all<br>households<br>121 |
|----------------------------------------------------|--------------------------|---------------------------|--------------------------|
| use part or all of it for own crop cultivation     | 78.8                     | 44.4                      | 47.9                     |
| give part or all of it to neighbours               | 18.2                     | 14.3                      |                          |
| dump part or all of it in the street               | 15.2                     | 34.3                      | 32.8                     |
| dump part or all of it in dustbins, pits, compound | -.-                      | 13.9                      | 12.6                     |
| sell all of it                                     | -.-                      | 0.9                       | 0.8                      |

<sup>\*</sup> Totals exceed 100% due to combined answers.

hand, many more (62%) of the livestock keepers were able to utilise part or all of the waste productively, namely for crop cultivation purposes, either by themselves or by their neighbours. Particularly the dung of the larger animals appeared not to be wasted in Nakuru town.

Re-use of animal waste by the livestock keepers themselves or by their neighbours is less common in the high-density areas (39%) as compared with the medium-density areas (69%). Again, the six Milimani livestock keepers stand out as they used 100% of their's animals' waste for their own crop cultivation. Dumping waste in the street is equally common in the medium- and high-density areas (35% and 32%, respectively). Hence, a larger number of livestock keepers in the high-density areas (29%) dispose of the animals' waste in dustbins, pits, etc. than those in the medium-density areas (5%).

## Chapter 8

# Farmers and non-farmers in town

Who are the urban farmers in Nakuru town? The best way to answer this question is by comparing the urban farmers with the non-farmers. For the purpose of this comparison, urban crop cultivators and urban livestock keepers have been combined to one group of 209 'urban farmers'. The group of urban 'non-farmers' consists of 385 households.

### HOUSEHOLD CHARACTERISTICS

Table 8.1 presents a summary of some major household characteristics of the two groups (see Appendix 6, Table A6.1 for more details). There is a difference in household size: farming households are larger. For instance, 57% of them counted five or more household members, against 23% of the non-farmers' households. Another important distinction between the two categories concerns household income. Although one has to consider income data always with great care, there is a clear indication that the poorest households — i.e. with a monthly income of less than Ksh. 5,000 — are

Table 8.1 Urban farmers and non-farmers: summary of household characteristics (%)<sup>\*</sup>

|                                 |                  | urban<br>farmers<br>(N=209) | non-<br>farmers<br>(N=385) |
|---------------------------------|------------------|-----------------------------|----------------------------|
| household size (nr. of members) | 5 or more        | 57.4                        | 22.9                       |
| household income (Ksh/month)    | up to 5,000      | 33.2                        | 64.0                       |
|                                 | more than 10,000 | 30.8                        | 11.4                       |
| house ownership                 | own house        | 21.5                        | 4.9                        |
| housing density of estate       | high             | 27.3                        | 46.5                       |

<sup>\*</sup> For details, see Appendix 6, Table A6.1.

underrepresented among the urban farmers. This is confirmed by the variable on house ownership: households owning the house in which they live are very much overrepresented among the farmers (although the category of households renting the house is by far the largest in both groups; see Table A6.1). The fourth variable presented in Table 8.1, housing density of the estate in which the household is located, is more of a geographical variable than a household variable in the strict sense. Farmers are somewhat overrepresented in the less densely housed areas (Table A6.1), non-farmers in the high-density estates. This is in line with findings presented earlier (Table 5.2) and is undoubtedly related to the availability of space.

#### CHARACTERISTICS OF THE HOUSEHOLD HEADS

A summary of a number of characteristics of the household heads is presented in Table 8.2 (more details are presented in Appendix 6, Table A6.2). The heads of the farmers' households are generally older than those of the non-farmers. For instance, over half (53%) of the heads of the former group are at least 40 years of age, against less than a quarter (22%) of the latter. This can be related to household size in the

Table 8.2 Urban farmers and non-farmers: summary of characteristics of household heads (%)\*

|                     |                                      | urban<br>farmers<br>(N=209) | non-<br>farmers<br>(N=385) |
|---------------------|--------------------------------------|-----------------------------|----------------------------|
| age (years)         | less than 30                         | 15.9                        | 40.3                       |
|                     | 40 or more                           | 53.2                        | 22.4                       |
| sex                 | female                               | 15.3                        | 22.1                       |
| ethnic group        | Kikuyu                               | 38.8                        | 46.9                       |
|                     | Luo                                  | 26.3                        | 16.4                       |
|                     | Luhya                                | 12.9                        | 20.1                       |
| type of residence   | full-time resident                   | 92.3                        | 97.4                       |
| marital status      | married                              | 82.3                        | 70.6                       |
|                     | single/divorced/separated/widowed    | 17.7                        | 29.4                       |
| educational level   | up to primary school                 | 32.0                        | 42.0                       |
|                     | secondary school                     | 45.0                        | 47.0                       |
|                     | more than secondary school           | 23.0                        | 11.0                       |
| occupational status | regularly employed                   | 40.2                        | 41.3                       |
|                     | temporarily employed/casual labourer | 10.5                        | 14.6                       |
|                     | self-employed                        | 45.5                        | 39.7                       |

\* For more details, see Appendix 6, Table A6.2.

previous table. In short, the urban farmers are generally the larger households, i.e. those with more mouths to feed. Households in the early stages of the "family life cycle" — young and small — are clearly underrepresented among the farmers.

In other respects — sex, ethnic background, type of residence, marital status, educational level and occupational status — there are no major differences between the heads of the farmers' households and those of the non-farmers' households (Table 8.2, Table A6.2). In both groups, the majority are male, are full-time residents in the household, are married, have at least secondary school, and have either a steady job or are self-employed.

A summary of the data on the migration history of the household heads is presented in Table 8.3 (for more details, see Appendix 6, Table A6.3). In both groups, the large majority (87%) was not born in Nakuru town. They came from all over Kenya, be it particularly from the central and western parts. On average, the farmers came earlier to Nakuru than the non-farmers. For instance, 37% of the farmers were living in the town for at least 20 years, against 11% of the non-farmers. Of the latter, the majority (60%) had come to Nakuru during the last ten years, i.e. twice as many as among the farmers. This difference should be seen in relation to the age of the household head: the farmers are on average older. Finally, the reasons to come to Nakuru do not differ between the two groups. The large majority came to work in Nakuru or to look for work there.

Table 8.3 Urban farmers and non-farmers: summary of migration history of household heads (%)\*

|                                                       |                                   | urban<br>farmers<br>(N=209) | non-<br>farmers<br>(N=385) |
|-------------------------------------------------------|-----------------------------------|-----------------------------|----------------------------|
| migration status                                      | born in Nakuru town               | 13.0                        | 13.4                       |
| year to come to Nakuru<br>(immigrants only)           | before 1970                       | 9.0                         | 2.8                        |
|                                                       | 1990 or later                     | 28.6                        | 60.2                       |
| main reason to come<br>to Nakuru<br>(immigrants only) | to look for work / to work        | 79.9                        | 75.7                       |
|                                                       | followed spouse/came with parents | 7.2                         | 10.1                       |
|                                                       | had relatives in Nakuru           | 7.3                         | 7.0                        |

\* For more details, see Appendix 6, Table A6.3



## HOUSEHOLD FOOD SECURITY

In order to have at least an indication whether the urban farmers were able to reach a higher level of household food security than the non-farmers, two general questions regarding this issue were asked. The results are presented in Table 8.4 (for more details regarding the answers, see Appendix 6, Table A6.4). As for the first question — "Did your household usually have enough to eat during 1998?" — the large majority in both groups answered outright positive: "yes, always". Nevertheless, if considered from the 'negative' way, one might also say that among the non-farmers in Nakuru the number of households with food problems in 1998 was twice as high as among the farmers (15% versus 7%). Not surprisingly, most of those with food problems belonged to the lowest-income category.

Table 8.4 Urban farmers and non-farmers: summary of general food security issues (%)<sup>\*</sup>

|                                    |                                      | farmers<br>(N=209) | non-farmers<br>(N=385) |
|------------------------------------|--------------------------------------|--------------------|------------------------|
| always food enough?                | yes, always                          | 93.3               | 84.9                   |
| most important food source in 1998 | urban production and/or other source | 45.0               | -.-                    |
|                                    | purchased                            | 36.8               | 68.1                   |
|                                    | purchased + rural production         | 17.7               | 29.9                   |

<sup>\*</sup> For more details, see Appendix 6, Table A6.4.

The second question concerned the most important food source in 1998. For many households it was difficult to mention *the* most important food source. Hence, the values indicating combined answers should be interpreted as 'fifty-fifty'. The results in Tables 8.4 and A6.4 (Appendix 6) show that although for very few urban farmers in Nakuru town their urban agricultural produce was the main food source, for almost half (45%) of them, urban farming provided them with at least half of their food requirements. Consequently, the farmers depended less on purchased food than the non-farmers. Tables 8.4 and A6.4 also show that *rural* farming was a source of food as well: 18% of the urban farmers and almost one-third (31%) of the non-farmers derived about half of their food from own rural agricultural production (rural farming will further be dealt with in the Chapter 9).

## NON-FARMERS

The non-farmers were asked why they had not cultivated crops or kept livestock in town in 1998. A summary of the reasons mentioned, including the main reason, is presented in Table 8.5 (all reasons are presented in Appendix 6, Table A6.5). It is clear that although a wide variety of reasons were given, the land issue is the main one, at a distance followed by lack of other resources, legal considerations and various other reasons.

Table 8.5: Non-farmers: reasons for not farming in town by type of farming (%)<sup>\*</sup>

|                            |                               | no crop cultivation<br>(N=434) |                | no livestock keeping<br>(N=473) |                |
|----------------------------|-------------------------------|--------------------------------|----------------|---------------------------------|----------------|
|                            |                               | reasons<br>(>100%)             | main<br>reason | reasons<br>(>100%)              | main<br>reason |
| land<br>issues             | no access to urban land       | 85.7                           | 75.6           | 74.4                            | 62.8           |
|                            | have access to rural land     | 8.1                            | 2.3            | 5.7                             | 1.9            |
| lack of other<br>resources | no capital                    | 28.6                           | 9.4            | 24.1                            | 10.6           |
|                            | lack of time                  | 7.1                            | 4.4            | 6.6                             | 4.4            |
| legal con-<br>siderations  | harassment                    | 1.8                            | 0.2            | 4.7                             | 1.7            |
|                            | disapprove myself or landlord | 5.3                            | 0.9            | 11.4                            | 3.8            |
| other<br>reasons           | not worthwhile                | 5.3                            | 2.5            | 7.2                             | 5.1            |
|                            | had not thought about it      | 0.9                            | 0.7            | 2.5                             | 2.5            |
|                            | was not in Nakuru             | 2.3                            | 2.1            | 1.7                             | 1.7            |

<sup>\*</sup> A complete overview of the reasons is presented in Appendix 6, Table A6.5.

The lack of access to land within the municipality is by far the most important reason for the non-farmers not to be engaged in some agricultural activity (Table 8.5). This applies even more to crop cultivation than to livestock keeping, probably because generally speaking, there is more land required for growing crops than for keeping a few (small) animals. Some households do indeed keep their animals inside the house. For some non-farmers there was no need to farm in town because they had access to a plot in the rural areas. However, for many others this is not a reason not to farm in town as well (see Chapter 9).

Lack of other resources, such as capital, labour and time, was also quite frequently mentioned (Tables 8.5 and A6.5). Capital in particular was a problem for many, but this is a factor which is not specific for these types of activities. For both crop cultivation and livestock keeping, lack of these resources was mentioned equally often. That cannot be said of the legal considerations, which were more often mentioned as a reason not to keep animals than not to grow crops. This is probably due to the fact that livestock keeping is generally more considered as a nuisance than crop cultivation. As Tables 8.5 and A6.5 show, the disapproval of farming in town can come from various levels: the municipality, the landlord, neighbours and, finally, the people themselves.

The 'other reasons' include people for whom farming in town was simply not an option (Table 8.5). Particularly among the non-livestock keepers, for 10% of them it was either not seen as an activity which is worthwhile or the respondent had never considered it. Finally, for a few people, the question was not applicable because they did not live (yet) in Nakuru town in 1998.

Some of those households *not* practicing urban farming in 1998 had actually done so before: 34 had cultivated crops and 35 had kept livestock. A variety of reasons were given why they had stopped farming, for instance theft of the crops, plot used for another purpose, plot repossessed by the owner, lack of rain, and 'not profitable'. The reasons to stop with keeping livestock were much less diverse and concentrated on the problems of pests and diseases and of theft and insecurity.

## Chapter 9

# Rural farming

As mentioned in Chapter 1, an urban farmer is defined as an urban dweller practicing any agricultural activity. These activities can take place either within the administrative boundaries of Nakuru town ('urban farming') or in the rural areas, i.e. outside the boundaries of the town ('rural farming'). In both cases, farming is part of the livelihood of the Nakuru townspeople. So far, this report has only dealt with the urban part of the farming activities of the Nakuru population. The present chapter deals with rural farming activities. However, since the study was focusing on *urban* farming, the data on *rural* farming can be no more than indications (rural farming by Nakuru townsmen is the topic of a separate, detailed study based on the present first findings and which is planned to start in 2001).

Of the 594 households interviewed in Nakuru town, 366 (62%) could be classified as 'rural farmer', i.e. those who had indicated either to cultivate crops or to keep livestock (or do both) in the rural areas. Of these, 361 (61%) could be classified as 'rural crop cultivators' and 222 (37%) as 'rural livestock keepers'. These figures indicate that five of the rural farmers did not grow crops but kept livestock only, while 144 cultivated crops only and the remaining 217 practiced mixed farming. Another 5% of the Nakuru households obtained some income from renting out rural land. When comparing the four income groups, Table 9.1 shows that, unlike *urban* farming, *rural* farming is much more equally distributed between the various income categories. Nevertheless, the figures indicate that the lowest income category is somewhat less 'rural-oriented' than the three higher income classes.

Table 9.1 Rural farming by income class (%)

| income class<br>(Ksh/month) | N   | rural crop<br>cultivation | rural live-<br>stock keeping | rural land<br>renting |
|-----------------------------|-----|---------------------------|------------------------------|-----------------------|
| up to 5,000                 | 310 | 55.5                      | 31.3                         | 5.2                   |
| 5,001 - 10,000              | 167 | 65.9                      | 42.5                         | 4.8                   |
| 10,001 - 20,000             | 74  | 67.6                      | 44.6                         | 4.1                   |
| more than 20,000            | 32  | 65.6                      | 43.8                         | -.-                   |

### RURAL PLOTS

Tables 9.2 and 9.3 present some basic information on the rural plots and the use of them. On average, a 'rural farmer' had access to 1.17 plots outside town, with an average plot size of 4.4 acres (Table 9.2). This means that the 'average rural farmer' in Nakuru town had more than five acres of rural land at his disposal in 1999. This figure is much higher for the highest income group (15.4 acres), due to a combination of two factors: they had somewhat more plots on average per household (1.33) while the average size of the plots was much bigger (11.6 acres) than those of the other income groups.

Table 9.2 Rural plots (%; N=467)

|                                                   |      |
|---------------------------------------------------|------|
| (1) average number of plots/household             | 1.17 |
| (2) average plot size (acres)                     | 4.4  |
| (3) average number of acres per household (1 x 2) | 5.1  |

In considering the figures shown in Table 9.2, one should realise that there is substantial variation between numbers, sizes and income classes. For instance, 15% of the plots of the Nakuru 'rural farmers' were less than one acre in size. The four income groups did not differ very much in this respect, be it that the poorest group was overrepresented (21% versus 9 to 13% in the other three groups), which could be expected. Even so, it is not surprising that the highest income group was overrepresented in the ten-acres-and-more category (30% versus 6 to 13%, and with an average of 10%).

Map 9.1 shows the geographical distribution of the rural plots (in order to avoid confusion, the old districts — i.e. before the large-scale subdivision of districts started — have been used). By province, three concentration areas can be distinguished: Rift Valley, Western and Nyanza account for 90% of all plots. A closer look reveals that three districts in particular stand out, accounting for over half of the plots: Nakuru (31%), Kakamega (13%) and Siaya (11%). Nandi District is conspicuously absent as far as the location of rural plots is concerned.

According to the literature, rural land concerns land in the home area, i.e. in the village where the urban dweller came from and where his/her family is still living. Although we do not have data on both place of origin of the Nakuru townspeople and location of rural plots *below* the district level, one can properly assume that if the district is the same for the two variables, the plot is very likely to be located in the home area. The majority (71%) of the 'rural farmers' had indeed at least one plot in the home district (Table 9.3), although some of them had a plot in another district as well. However, almost three out of each ten 'rural farmers' had his/her plot(s) in another district than the district of origin. Of all the plots outside one's home district, the majority (66%) appeared to be located in Nakuru District; hence, at a relatively short distance from the place of residence. This may be related to the fact that quite a number of the (former) large farms in the district have been subdivided throughout the years, so plots became available.

Table 9.3 Location of rural plots and district of origin of 'rural farmer' (%; N=327\*)

|                                                                        |      |
|------------------------------------------------------------------------|------|
| at least one plot in district of origin                                | 66.7 |
| at least one plot in district of origin <i>and</i> in another district | 4.6  |
| at least one plot in other district (outside district of origin)       | 28.7 |
| total                                                                  | 100  |

\* Immigrants only.

Table 9.4 presents a summary of some basic data regarding ownership and use of the rural plots (more detailed information is given in Appendix 7, Table A7.1). Over half (56%) of the rural plots were owned by the Nakuru households themselves. The rest was mainly land belonging to the family 'back home'. Some plots (5%) were rented

Map 9.1: Geographical distribution of rural plots (districts)

from a landlord. Ownership of rural plots differs substantially in relation to income class: as household income is higher, the percentage of plots owned is higher and the percentage of plots owned by the (rural) family is lower. For instance, the large majority (87%) of the highest income group own the plot, while for the poorest this applies to hardly half (48%) of the plots, the other half (47%) being family land.

Table 9.4 Summary of ownership and use of rural plots (%; N=467)<sup>a</sup>

|            |                           |      |
|------------|---------------------------|------|
| ownership  | own land                  | 56.2 |
| of plot    | family land <sup>b</sup>  | 38.5 |
| user of    | myself <sup>c</sup>       | 57.2 |
| plot       | other family <sup>d</sup> | 32.3 |
| how is     | crops only                | 42.1 |
| plot used? | crops + livestock         | 49.2 |

Notes: a For more details, see Appendix 7, Table A7.1.  
b Includes 'relative's land' (4 out of 179 cases).  
c In 14 (out of the 267) cases, the plot was partly used by 'other family', in 3 cases it was partly rented out.  
d In 1 case the land was partly rented out.

The same pattern can be seen with the person(s) actually using the plot (Tables 9.4 and A7.1). Not surprisingly, ownership on the one hand and the person using the plot are highly related. For instance, 67% of those who stated that they were the owners of the plot used it themselves (and over half of the remaining plots were used by other family). And of the plots indicated as being 'family land', 61% were used by other family (and almost all other plots either by the Nakuru household or together with the family). However, not all the plots were either used by the Nakuru townspeople themselves or their families back home: 19 plots (4%) were rented out, 9 plots were used freely by somebody else, while another 21 were not used by anyone (Table A7.1). This occurred in all income groups.

In order to establish whether there is a relationship between the user of the plot (i.e. either 'myself' or 'other family') and the distance to the rural plot, the latter variable was operationalised as a dichotomy: the 'inner ring' consisting of Nakuru District itself plus the neighbouring districts (Kiambu, Nyandarua, Laikipia, Baringo, Kericho and Narok) and the 'outer ring' consisting of all other districts (see also Map

9.1). It appeared that 65% of the plots in the 'inner ring' were used by the Nakuru households themselves, against 50% of the plots in the 'outer ring'.

The large majority of the plots (over 90%) were used to grow crops and on roughly over half of these livestock was kept as well (Table 9.4). Very few plots were solely used to keep livestock (Table A7.1), which is obvious since very few of the 366 'rural farmers' did not grow crops. Twenty-nine plots (6%) had been left idle (Table A7.1). Although among the highest income group, the percentage of plots being left idle was higher (13%) than among the other three income groups (5 to 6%), half of the idle plots were owned by households from the lowest income category. The percentage of plots left 'idle' is higher than the percentage 'used by nobody' (4.5%; see Table A7.1). Considering oneself as the user of the plot apparently does not automatically mean that one actually does use it every year.

There is a relationship between the way the plots are used and the size of the plots. As plots are bigger, mixed farming — i.e. both crop cultivation and livestock keeping — is more common. For instance, on 81% of the plots bigger than ten acres, mixed farming was practiced, while this applied to only 16% of the plots smaller than one acre. Leaving the plot idle is also related to the size of the plot: 40% of the 'idle' plots were smaller than one acre.

The importance, in qualitative terms, of the rural plots for the Nakuru townspeople is shown in Table 9.5. Almost three-quarters of the plots were a source of food, while almost half were (also) a source of income. The income component was somewhat more important for the highest income group (63%) than for the others. Conspicuously, about one-fifth of the plots were not considered as either food source or

Table 9.5 Importance of rural plots (%; N=467)

|                                       |      |
|---------------------------------------|------|
| food source only                      | 32.3 |
| both food and income source           | 39.7 |
| income source only                    | 8.6  |
| neither food source nor income source | 19.4 |
| total                                 | 100  |

income source. This is a much higher percentage than the combined user categories 'rented out', 'somebody else' and 'nobody' in Table 9.4, which indicates that of some of the plots used by the family none of the produce reached the household in Nakuru town.

#### GENDER DIFFERENCES

Are there gender differences regarding access to rural land, size of the rural plots, ownership and use of the plots, as well as distance to the plots? As far as access to rural land is concerned, there was indeed a difference, the percentage of male-headed households with access to rural land being almost twice as high as that of the female-headed households (28% and 15%, respectively; see Table 9.7 below). Regarding plot sizes, there are no differences, however. For instance, 38% of the plots of the male-headed households and 44% of the plots of the female-headed households are smaller than two acres. There is also very little difference regarding ownership and use of the rural plots. For instance, the percentages 'own land' are almost equal: 57% and 48%, respectively. In both groups, about half of the households (54% and 46%, respectively) mention to use the plot themselves. Moreover, the large majority among both male-headed and female-headed households (91% and 94%, respectively) use the plot for crop cultivation, either in combination with livestock or not.

The only other difference besides the percentage of male-headed and female-headed households stating to have access to rural land concerned the location of the plots. The rural plots of the female-headed households are generally nearer to Nakuru town than those of the male-headed households. For instance, 63% of the rural plots of the female-headed households were located in Rift Valley Province, against 39% of those of the male-headed households. Half (49%) of the plots of the female-headed households were even located within Nakuru District, which applied to 29% of the plots of the male-headed households. This indicates that distance to the rural plots is a greater constraint for female-headed households than for male-headed households.

#### RURAL FARMERS AND NON-FARMERS

In how far differ the 'rural farmers' from the 'non-farmers'? Tables 9.6 and 9.7 summarise, respectively, some household characteristics and characteristics of the house-

hold heads of the two groups (details are given in Appendix 7, Table A7.2). The three household characteristics in Table 9.6 refer to three possible reasons for urban households to practice rural farming: the number of mouths to fill (household size), the purchasing power of the household (income class) and the amount of space in the (urban) residential area (housing density of estate). The figures show that neither of these variables seem to be determinants to engage in rural farming. As shown in Table 8.1, household size seemed to be an important determinant to practice *urban* farming, but it is not for *rural* farming. Poorer households do not practice rural farming more often than richer households; on the contrary. And lack of space for *urban* farming in the urban residential area seems not to be compensated by a higher frequency of *rural* farming.

Table 9.6 Rural farmers and non-farmers: summary of household characteristics (%)\*

|                                        |                  | rural<br>farmers<br>(N=366) | non-<br>farmers<br>(N=228) |
|----------------------------------------|------------------|-----------------------------|----------------------------|
| household size (nr. of members)        | 5 or more        | 35.2                        | 34.6                       |
| household income class<br>(Ksh./month) | up to 5,000      | 47.8                        | 61.8                       |
|                                        | more than 10,000 | 20.1                        | 15.1                       |
| housing density of estate              | high             | 45.6                        | 40.4                       |

\* For more details, see Appendix 7, Table A7.2.

The question whether rural farming and urban farming are substitutes of each other can also be raised as follows: do urban dwellers who practice *rural* farming refrain from *urban* farming and vice versa? This appeared not to be the case: the percentages *urban* farmers among both rural farmers and non-farmers appeared to be exactly the same, namely 35%. This applies to crop cultivators (25 and 30%, respectively) as well as to livestock keepers (20 and 21%, respectively). In other words, those urban dwellers in Nakuru who do *not* have access to a *rural* plot are *not* more inclined to engage in *urban* farming than those who *do* have access to a rural plot.

Table 9.7 shows some characteristics of the household heads of 'rural farmers' and

'non-farmers', respectively (details are presented in Appendix 7, Tables A7.2 and A7.3). Only those variables are presented in Table 9.7 which do show a difference between the two groups. Hence, regarding such characteristics as age, type of residence, educational level and occupational status, the two groups appeared to be very similar (see table A7.2). However, regarding sex and marital status and regarding ethnic group, the situation is different. Sex and marital status are to some extent related: many of the 'one-adult households' (single, divorced, separated or widowed) are female-headed households and one can imagine that for these households it is much more problematic to practice farming somewhere outside town than for households with a head *and* a spouse.

As far as ethnic background is concerned, it is conspicuous that the Kikuyu (accounting for 44% of all household heads, by far the largest group in Nakuru town) practice much less rural farming than the other major ethnic groups (Tables 9.7 and A7.2). Of all the Kikuyu households in Nakuru, about half of them were farming in the rural areas, compared with about two-thirds to over three-quarters of the Luo, Luhya, Kalenjin, Kisii and Kamba (which is also visible on Map 9.1).

Table 9.7 Rural farmers and non-farmers: summary of characteristics of household heads (%)<sup>\*</sup>

|                                  |                                   | rural<br>farmers<br>(N=366) | non-<br>farmers<br>(N=228) |
|----------------------------------|-----------------------------------|-----------------------------|----------------------------|
| sex                              | female                            | 14.8                        | 27.6                       |
| marital status                   | single/divorced/separated/widowed | 18.6                        | 36.0                       |
| ethnic group                     | Kikuyu                            | 36.2                        | 56.6                       |
|                                  | Luo                               | 24.4                        | 12.7                       |
|                                  | Luhya                             | 20.8                        | 12.3                       |
| migration status                 | born in Nakuru town               | 9.6                         | 18.9                       |
| <i>immigrants only:</i>          |                                   | (N=331)                     | (N=185)                    |
| year to come to Nakuru           | 1990 or later                     | 53.5                        | 40.7                       |
| main reason to come<br>to Nakuru | to look for work / to work        | 81.7                        | 69.8                       |
|                                  | followed spouse/came with parents | 5.8                         | 15.1                       |

<sup>\*</sup> For more details, see Appendix 7, Table A7.2 (characteristics of household heads) and Table A7.3 (migration history of household heads).

As for the 'migration history' of the household heads, some small differences between the two groups are discernable, too (Tables 9.7 and A7.3). The percentage 'non-immigrants' among the non-farmers was twice as high as among the farmers, indicating that among the non-farmers the percentage of '100% urbanized people' — i.e. for whom 'town' is not only the 'house' but also the 'home' — is higher. Among the farmers, a larger percentage came to Nakuru more recently, i.e. during the 1990s, which is an indication that ties with the rural 'home' are stronger as the migration took place more recently. However, one should be careful with such a conclusion because a breakdown in migration intervals shows that the percentages of people who had come before 1980 and after 1994 were the same in the two groups. Finally, there is a small difference regarding the main reasons to come to Nakuru. Among the farmers, the percentage who came to (look for) work was higher, while among the non-farmers the people who 'followed spouse/came with parents' was relatively higher. These two categories are undoubtedly related, as well as with the difference regarding sex, the percentage of females among the household heads of the non-farmers being higher.

## Chapter 10

# Summary and conclusions

Urban farmers in this report are defined as urban dwellers engaged in farming activities, i.e. either within the municipal boundaries of the town (urban farming) or in the rural areas (rural farming). The survey of 1999 among 594 households in the built-up area of Nakuru town (the largely 'rural' areas that were added to the town with the boundary extension of 1992 — and in this report defined as the 'peri-urban zone' — were not included in the survey) revealed that 75% of the population was farming in one way or the other. Thirty-five percent farmed in town, while about 60% did so in the rural areas.

### CROP CULTIVATION

Just over one-quarter of the Nakuru population cultivated crops in town in 1998, on plots greatly varying in size, ranging from a few square metres to over 5,000 square metres. The average plot was almost 1,000 square metres or 0.25 acres. The total area under crops in the built-up area of Nakuru amounted in 1998 to some 5,200 acres. The majority of the plots (61%) were located in the people's own compounds. Most plots (77%) had been taken into use since 1990, about half even after 1995, indicating that crop cultivation at the present scale is a fairly recent phenomenon in Nakuru.

Although a large range of different crops is being cultivated, three crops stand out: maize, kales (*sukuma wiki*) and beans, which are being grown on about 60% of the plots. Onions, spinach, tomatoes, Irish potatoes, cowpeas, bananas and spider plant (*saget*) were found on 25 to 11% of the plots. On the large majority of the plots, mixed cropping was practiced. In all, it was estimated that some 6 million kg of crops were harvested in 1998 which contributed about 30% to the households' energy requirements if all of it would have been self-consumed. Since about 25%

was sold, the actual contribution was about 22%, though from the selling of the remainder some cash income was obtained.

Cultivation practices are quite traditional, with simple tools. Inputs used varied and were mostly organic, though partly also chemical. Between 40 and 50% practiced some irrigation, mostly with tap water. Very few crop cultivators had received any technical assistance. Apart from the typical problems related to farming, theft of crops was a major urban-related constraint to crop cultivation.

#### LIVESTOCK KEEPING

One-fifth of the Nakuru households keep livestock in town. Although the absolute number of households keeping large livestock in town is relatively small, the total number of cattle, sheep, goats and pigs in the built-up areas of Nakuru town can be estimated at some 25,000 in 1998. Small livestock (mainly chicken, but also ducks, rabbits, doves and turkeys) is more common, their numbers totalling some 380,000. Large livestock is kept for both self-consumption and selling. Small livestock is more for self-consumption.

Livestock is partly kept in one's own compound and partly in free range. However, small livestock is somewhat more often freely roaming around than large livestock. In general, large livestock receives more attention than small livestock, at least when one looks at the percentages of households using certain inputs. In contrast with crop cultivation, quite some livestock keepers had received technical assistance, especially those keeping large livestock (55%). This could not prevent, however, that the death rate among the animals was equally high among both the ones who received assistance and those who did not. Related to this, 'diseases' was by far the most often mentioned constraint.

An important environmental issue in town is related to the waste from livestock. About one-third of the livestock keepers dumped all or part of the waste in the street, but this was more common for the waste of small than of large livestock. Most of the waste, however, was used for crop cultivation, either for the livestock keepers themselves or for their neighbours.

#### IMPORTANCE OF FARMING IN TOWN

For the large majority of the households engaged in farming in town, the need for (additional) food was the main reason to do so. This applies even more to crop cultivation (90%) than to livestock keeping (74%). Livestock is also kept in order to obtain some additional income and/or to diversify one's income sources. As perceived by the respondents, about 40% of the crop cultivators stated that their urban cultivation constituted at least half of the food they consumed. And the large majority of those engaged in urban farming said that it formed at least an additional food and/or income source, while for about one-quarter it was even the major source.

#### FARMERS AND NON-FARMERS

Compared with the non-urban farming households, the households performing urban farming are generally larger. Hence, the more mouths to be fed, the more likely a household to be engaged in urban farming. Another difference between farmers and non-farmers is household welfare level (at least measured in terms of monthly cash income): the poor are underrepresented among the urban farming households. Still, the low-income households are the largest group among the urban farmers and it is particularly for this group that urban agriculture is very important as a food and income source.

The dominant reason for the non-farmers *not* to farm in town was the lack of access to urban land, at some distance followed by other considerations of which lack of capital was the most important one. For some there was no necessity because of access to *rural* land, although for many others this was not a reason not to farm in town as well.

#### RURAL FARMING BY URBAN DWELLERS

As mentioned, an 'urban farmer' can also be an urban dweller farming in the *rural* areas. The survey of 1999 revealed that no less than 62% of the Nakuru population stated to be engaged in rural farming, almost all of them cultivating crops and 60% of them keeping livestock as well. These households had an average plot of about five acres at their disposal. Over half of the rural plots were located in three districts: Nakuru, Kakamega and Siaya. Thirty percent of the plots were *not* located in the district where the household came from.

As found in other studies in Sub-Saharan Africa, access to rural land is not the same as owning the land and does not automatically mean that the urban dweller uses it him/herself. Over half (56%) of the plots were owned by the Nakuru townspersons, the other plots belonging mainly to the family. As a consequence, about the same percentages of the plots were used by 'myself' and by the family, respectively. Some plots were not used at all. There appears to be some relationship between the question who uses the plot and distance: as the plot is located further from Nakuru, it is more likely that the plot is used by others than the Nakuru household. Most plots were either used as a food source only or for both food and income.

Female-headed households are quite underrepresented among the rural farming households. Another difference between female-headed and male-headed rural farming households is that the plots of the former group are generally nearer to Nakuru town. This indicates that distance is a serious constraint for female-headed households as far as rural farming is concerned.

There were few differences between households performing rural farming and those who did not, the most important one being that one-adult households (including female-headed households) and Kikuyu households were underrepresented among the rural farming households. Another important finding was that rural and urban farming are *not* substitutes of each other: there are just as many households doing *urban* farming among the *rural* farming households as among the *non-rural* farming ones.

#### INCOME CLASSES

Although urban farming is common among all income classes in Nakuru town, the poorest households are quite underrepresented. Still, the largest group among the urban farmers are the low-income ones.

Plot sizes do not differ very much between the income categories. However, there is an important difference as far as yields from crop cultivation are concerned. For instance, the high-income households realise a harvest which is almost three times as big as that of the low-income households. This may partly be related to the use of improved seeds and irrigation, inputs which are more common among the high-

income households, and partly to the factor labour, as the high-income households are able to hire additional labour when needed. Theft of crops was more of a problem for the low-income households, which is likely to be due to the fact that their plots are more often not located in the compound.

Livestock keeping can also be found among all income categories and the animals are kept for the same reasons, namely partly for own consumption and partly for selling. However, the high-income households use more often relatively expensive inputs and receive more often technical assistance. They also hire additional labour more frequently. Nevertheless, for all income classes the health of the animals was the dominant constraint. Dealing with the animals' waste was more of a problem for the low-income households, because the habit of dumping it in the street was more common among them than among the higher-income households.

For both higher and lower-income households, the major reason to perform urban farming was the need for additional food. However, the need for additional income was more often mentioned by the low-income households. Another difference has to do with the contribution of urban crop cultivation to household food consumption which was, according to the respondents' perceptions, much higher among the low-income group. Hence, the percentage stating that they "could not survive without it" was also higher.

Unlike *urban* farming, *rural* farming is almost equally common among all income classes, even though the lowest income category is somewhat underrepresented. On average, the plots of the highest income group were much bigger (15 acres) than those of the other groups (about 5 acres). Regarding ownership and use of the plots, the income classes show very little differences, although plots being left idle were more common among the high-income households. For these households, the income component, besides the food component, of the rural plots was also more important than among the lower-income groups.

## CONCLUSIONS

Although the data presented in this report are rather basic and more detailed information is still to be gathered, some conclusions can already be made. The first one is

the simple observation that urban farming is an omnipresent fact of life in Nakuru town. People with a compound farm in there and many of those who do not have a compound farm elsewhere in the town, wherever some vacant land is available. Hence, urban farming is not restricted to certain areas in town or certain strata of the urban society, even though it is less common as housing density is higher and, related to this, the poorer households are underrepresented. But since the lower-income households form the majority of the urban inhabitants, they form the majority among the urban farming households as well. And it is exactly for this group that their urban farming activities have become a necessity of life. In other words, simply forbidding farming in town is not an option in the present time of economic crisis as it would hit these low-income people very hard.

Although many urban farming households indicated the importance of this economic activity in terms of household food provision and (to a lesser extent) as a source of income, yields from crop cultivation are very low, in particular among the poorer households. Moreover, the livestock that many households keep is suffering from diseases, while the mortality rate is very high. More technical assistance could therefore be very beneficial for many of these urban farmers, although a problem for the low-income households is that they often lack the money to buy sufficient and more expensive inputs. Small credit schemes in order to improve farming activities could solve this problem.

Urban farming is often considered as a menace for the town in terms of environment and health. Animals freely wandering around and the disposal of their waste in the street can cause serious problems. Crops cultivated on polluted sites or irrigated with untreated sewage water or polluted with exhaust fumes are thought to be unhealthy. The latter topic (pollution of crops) is being dealt with in a separate study. The present study shows that many animals are indeed roaming around in the street and that part of the waste is dumped in the street. On the other hand, most of the waste, and especially that of the large livestock, is being reused for local crop cultivation. Still, there is a task here for the local authorities together with local community groups (there are good examples of this type of cooperation in Nakuru).

The fact that in the present time, with all its economic and social uncertainties and

stress, urban farming is an important source of food, income and employment is something that can not be neglected by policy makers. At the same time, however, according to the municipal by-laws which date from the colonial period, farming in town is an illegal activity. Hence, there is need for regulations, the more so because municipal authorities of Nakuru are presently undertaking an urban planning exercise in the context of the Localising Agenda 21 programme. This involves environmentally-friendly planning and the municipal authorities recognise that UA is an inevitable part of that. The first step could be to designate zones where certain types of farming are allowed under certain conditions. An example would be that the number of cattle should be bound to a certain maximum and should only be kept under zero-grazing in the peri-urban areas and/or in compounds of a certain minimum size in the built-up area. The same principle could be implemented for for instance tall crops.

Since the local by-laws are municipality-specific, these could be adapted to such planning strategies. In designing such by-laws, the various acts which deals with agriculture and local government should be considered. Examples of such acts are the Public Health Act, the Agricultural Act, the Water Act, the Physical Planning Act, the Meat Control Act, the Local Government Act, the Chiefs Act, etc. There is need to review all such acts in order to construct a coherent set of regulations. The result could be a General Code, based on the local circumstances in Nakuru town.

In designing policies for urban agriculture, one should be aware that many urban people farm in the rural areas as well. But saying that urban households can do without urban farming because of their rural farming activities is missing the point. The study shows that urban and rural farming by urban dwellers are not substitutes of each other, in other words that it is not so that people who do not practice *urban* farming refrain from it because they practice *rural* farming or vice versa. *Urban* farming has to some extent to do with the need to fill the extra mouths during the stage that households are at their largest. *Rural* farming has to do with the fact that most urban dwellers are migrants from the rural areas and have inheritance rights to the land 'back home'. Nevertheless, it is therefore important to learn more about the importance of rural farming activities by the Nakuru households, the poor in particular. That will be the object of another separate study.

Finally, some prerequisites for any policy regarding the integration of urban agriculture in urban planning are (-) the recognition that agriculture is not only a rural activity but an accepted form of urban land use as well, (-) the understanding that farming is an important economic activity for many urban dwellers, (-) the conviction that urban agriculture has to be incorporated in any future town planning exercise, and (-) a fruitful working relationship between the municipal authorities and community-based organisations. The very positive thing about Nakuru is that, unlike many other African towns and cities, these prerequisites are all met.



## Appendix 1

### Geography of farming in Nakuru town

Table A1.1 Farmers, crop cultivators and livestock keepers in town by cluster, 1998 (%)

|    | cluster name     | housing density | nr. of house-holds in sample (=N) | percentage urban farmers | percentage urban crop cultivators | percentage urban live-stock keepers |
|----|------------------|-----------------|-----------------------------------|--------------------------|-----------------------------------|-------------------------------------|
| 1  | Lake View        | medium          | 42                                | 28.6                     | 26.2                              | 7.1                                 |
| 2  | Langalanga       | medium          | 43                                | 32.6                     | 25.6                              | 11.6                                |
| 3  | Flamingo I       | low             | 37                                | 29.7                     | 16.2                              | 18.9                                |
| 4  | Ziwani           | low             | 43                                | 25.6                     | 16.3                              | 16.3                                |
| 5  | Milimani         | low             | 8                                 | 87.5                     | 87.5                              | 75.0                                |
| 6  | Bangladesh       | medium          | 39                                | 38.5                     | 25.6                              | 30.8                                |
| 7  | London/Menengai  | medium          | 28                                | 71.4                     | 67.9                              | 46.4                                |
| 8  | Kabachia         | low             | 39                                | 82.1                     | 82.1                              | 35.9                                |
| 9  | Lanet            | medium          | 56                                | 37.5                     | 33.9                              | 17.9                                |
| 10 | Mwariki          | high            | 55                                | 27.3                     | 10.9                              | 21.8                                |
| 11 | Rhonda/Sewage    | medium          | 23                                | 39.1                     | 34.8                              | 26.1                                |
| 12 | Rhonda/Pondamali | high            | 48                                | 31.3                     | 14.6                              | 18.8                                |
| 13 | Rhonda/Weavers   | high            | 38                                | 31.6                     | 23.7                              | 21.1                                |
| 14 | Rhonda/Muslim    | high            | 33                                | 15.2                     | 15.2                              | -.-                                 |
| 15 | Rhonda/Kaptembwa | high            | 62                                | 16.1                     | 4.8                               | 14.5                                |
|    | Total            |                 | 594                               | 35.2                     | 26.9                              | 20.4                                |

Table A1.2 Characteristics of urban plots by housing density (%)

|                                           | (N=)                 | high<br>density<br>(35) | medium<br>density<br>(138) | low<br>density<br>(7) | total<br>(180) |
|-------------------------------------------|----------------------|-------------------------|----------------------------|-----------------------|----------------|
| location                                  | riverside            | -.                      | 0.7                        | -.                    | 0.6            |
|                                           | roadside             | 2.9                     | 4.5                        | -.                    | 4.0            |
|                                           | railwayside          | -.                      | 10.4                       | -.                    | 8.0            |
|                                           | under powerline      | -.                      | 2.2                        | -.                    | 1.7            |
|                                           | in own compound      | 52.9                    | 60.4                       | 100.0                 | 60.6           |
|                                           | within estate        | 29.4                    | 14.2                       | -.                    | 16.6           |
|                                           | in other estate      | 11.8                    | 5.2                        | -.                    | 6.3            |
|                                           | elsewhere            | 2.9                     | 2.2                        | -.                    | 2.3            |
|                                           | Total                | 100                     | 100                        | 100                   | 100            |
| distance to<br>plot in minutes<br>walking | less than 10 minutes | 65.7                    | 69.9                       | 100.0                 | 70.0           |
|                                           | 10-30 minutes        | 11.4                    | 13.0                       | -.                    | 12.2           |
|                                           | 30-60 minutes        | 11.4                    | 10.1                       | -.                    | 10.0           |
|                                           | more than 60 minutes | 11.4                    | 7.2                        | -.                    | 7.8            |
|                                           | Total                | 100                     | 100                        | 100                   | 100            |
| cultivate plot<br>since                   | before 1980          | 8.6                     | 7.2                        | -.                    | 7.2            |
|                                           | 1980-1989            | 20.0                    | 15.9                       | -.                    | 16.1           |
|                                           | 1990-1994            | 14.3                    | 27.5                       | 42.9                  | 25.6           |
|                                           | 1995-1998            | 57.1                    | 49.3                       | 57.1                  | 51.1           |
|                                           | Total                | 100                     | 100                        | 100                   | 100            |
| plot size in m <sup>2</sup>               | <10                  | 11.4                    | 14.5                       | -.                    | 13.4           |
|                                           | 10-49                | 2.9                     | 21.0                       | 16.7                  | 17.3           |
|                                           | 50-99                | 8.6                     | 9.4                        | -.                    | 8.9            |
|                                           | 100-499              | 28.6                    | 18.8                       | -.                    | 20.1           |
|                                           | 500-999              | 11.4                    | 8.0                        | -.                    | 8.4            |
|                                           | 1000-4999            | 34.3                    | 22.5                       | 83.3                  | 26.8           |
|                                           | 5000+                | 2.9                     | 5.8                        | -.                    | 5.0            |
|                                           | Total                | 100                     | 100                        | 100                   | 100            |
| ownership<br>of plot                      | own land             | 57.1                    | 25.5                       | 57.1                  | 33.0           |
|                                           | landlord             | 28.6                    | 50.4                       | 42.9                  | 45.8           |
|                                           | government           | 2.9                     | 17.5                       | -.                    | 14.0           |
|                                           | other                | 11.4                    | 6.6                        | -.                    | 7.3            |
|                                           | Total                | 100                     | 100                        | 100                   | 100            |

## Appendix 2

### Crops cultivated in Nakuru town, 1998

Table A2.1 Crops cultivated in Nakuru (% of plots; N=180)

|    |                               |      |    |                                     |     |
|----|-------------------------------|------|----|-------------------------------------|-----|
| 1  | maize                         | 61.7 | 22 | black night shade ( <i>managu</i> ) | 2.8 |
| 2  | kales                         | 61.1 | 23 | cucumber                            | 2.8 |
| 3  | beans                         | 56.1 | 24 | parsley ( <i>dhania</i> )           | 2.8 |
| 4  | onions                        | 25.0 | 25 | oranges                             | 2.2 |
| 5  | spinach                       | 20.0 | 26 | sweet potatoes                      | 2.2 |
| 6  | tomatoes                      | 19.4 | 27 | arrow root                          | 1.7 |
| 7  | Irish potatoes                | 17.8 | 28 | egg plant ( <i>mbiriganya</i> )     | 1.7 |
| 8  | bananas                       | 15.6 | 29 | <i>mavaki</i> (local vegetable)     | 1.7 |
| 9  | cowpeas                       | 15.6 | 30 | millet                              | 1.7 |
| 10 | spider plant ( <i>saget</i> ) | 11.1 | 31 | passion fruit                       | 1.7 |
| 11 | pepper                        | 7.2  | 32 | American herb                       | 1.1 |
| 12 | sugarcane                     | 7.2  | 33 | mango                               | 1.1 |
| 13 | cabbage                       | 6.1  | 34 | capsicum                            | 0.6 |
| 14 | carrots                       | 6.1  | 35 | guava                               | 0.6 |
| 15 | pawpaw                        | 6.1  | 36 | lettuce                             | 0.6 |
| 16 | pumpkins                      | 5.6  | 37 | loquarts                            | 0.6 |
| 17 | green peas                    | 5.0  | 38 | mushrooms                           | 0.6 |
| 18 | avocado                       | 3.9  | 39 | pineapple                           | 0.6 |
| 19 | napier grass                  | 3.9  | 40 | strawberry                          | 0.6 |
| 20 | cassava                       | 3.3  | 41 | water melon                         | 0.6 |
| 21 | amaranth ( <i>terere</i> )    | 3.3  |    |                                     |     |

Table A2.2 Problems with crop cultivation in town (%; N=160)

|                              | mentioned<br>as a<br>problem | mentioned<br>as the main<br>problem |
|------------------------------|------------------------------|-------------------------------------|
| no problem                   | 16.3                         | 16.3                                |
| theft of crops               | 36.6                         | 24.4                                |
| inadequate rainfall          | 35.0                         | 24.4                                |
| destruction by animals       | 23.8                         | 10.0                                |
| pests/insects                | 22.5                         | 8.8                                 |
| lack of water for irrigation | 12.5                         | 9.4                                 |
| diseases                     | 9.4                          | 2.5                                 |
| lack of inputs/capital       | 6.9                          | 1.9                                 |
| harassment                   | 2.5                          | -.                                  |
| bad quality seeds            | 1.9                          | -.                                  |
| poor soil                    | 1.3                          | -.                                  |
| lack of space/land           | 1.3                          | 1.3                                 |
| lack of labour               | 0.6                          | 0.6                                 |
| weeds                        | 0.6                          | 0.6                                 |
| too much rainfall            | 0.6                          | -.                                  |
| poor seasonal timing         | 0.6                          | -.                                  |
| sewage burst                 | 0.6                          | -.                                  |
| total                        |                              | 100                                 |

## Appendix 3

### Crops: calculation of 'percentage self-consumed'

The amounts self-consumed (%) in Table 6.1 were calculated by translating the qualitative values of the amounts self-consumed as indicated in Table A3.1 below into percentages as follows:

|                 |                     |                    |
|-----------------|---------------------|--------------------|
| all of it: 100% | about half: 50%     | small portion: 10% |
| most of it: 75% | less than half: 30% | none: 0%           |

It is obvious that the percentages presented in Table 6.1 can at best be indications.

Table A3.1 Crops: amounts self-consumed by crop type (N)

| amount self-consumed: | all<br>of it | most<br>of it | about<br>half | less than<br>half | small<br>portion | none | total |
|-----------------------|--------------|---------------|---------------|-------------------|------------------|------|-------|
| kales                 | 48           | 34            | 10            | 8                 | 6                | 3    | 109   |
| maize                 | 45           | 35            | 11            | 2                 | 4                | 4    | 101   |
| beans                 | 51           | 22            | 7             | 3                 | 2                | 3    | 94    |
| onions                | 22           | 15            | 2             | 2                 | 2                | 2    | 45    |
| spinach               | 11           | 12            | 2             | 3                 | 5                | 3    | 36    |
| tomatoes              | 20           | 8             | 2             | 1                 | -                | 4    | 35    |
| Irish potatoes        | 19           | 9             | 1             | -                 | 1                | 2    | 32    |
| cowpeas               | 16           | 3             | 2             | -                 | 3                | 4    | 28    |
| bananas               | 13           | 3             | 3             | -                 | -                | 8    | 27    |
| <i>saget</i>          | 8            | 5             | 1             | 2                 | 1                | 2    | 19    |

## Appendix 4

### Calculation of energy from urban crop production

Table A4.1 Calculation of energy from urban crop production

|                                                                                     | nr. of<br>h'holds <sup>a</sup> | kg. harv-<br>ested <sup>a</sup> | aggregate<br>kgs. | kcal/kg as<br>p..... <sup>b</sup> | aggregate<br>kcal.      |
|-------------------------------------------------------------------------------------|--------------------------------|---------------------------------|-------------------|-----------------------------------|-------------------------|
| 1 kales                                                                             | 109                            | 84                              | 9,156             | 384                               | 3,515,904               |
| 2 maize                                                                             | 101                            | 224                             | 22,624            | 3,630                             | 82,125,120 <sup>c</sup> |
| 3 beans                                                                             | 94                             | 75                              | 7,050             | 3,390                             | 23,899,500              |
| 4 onions                                                                            | 45                             | 26                              | 1,170             | 187.2                             | 219,024                 |
| 5 spinach                                                                           | 69                             | 92                              | 6,348             | 384                               | 2,437,632               |
| 6 tomatoes                                                                          | 35                             | 15                              | 525               | 196                               | 102,900                 |
| 7 Irish potatoes                                                                    | 32                             | 88                              | 2,816             | 637.5                             | 1,795,200               |
| 8 cowpeas                                                                           | 28                             | 67                              | 1,876             | 3,400                             | 6,378,400               |
| 9 bananas                                                                           | 27                             | 4                               | 108               | 777.2                             | 83,916                  |
| 10 saget                                                                            | 19                             | 33                              | 627               | 224                               | 140,448                 |
| 11 other crops (cumul. 80% of plots) <sup>d</sup>                                   | 128                            | 32.7                            | 4,184             | 2,308                             | 9,656,672               |
| 12 total energy produced (1+2+...11)                                                | 160                            |                                 |                   |                                   | 130,354,716             |
| <hr/>                                                                               |                                |                                 |                   |                                   |                         |
| 13 daily energy requirement per capita                                              |                                |                                 |                   |                                   | 2,200                   |
| 14 annual energy requirement per capita (13x365 days)                               |                                |                                 |                   |                                   | 803,000                 |
| 15 annual energy requirements per household (14x3.4 capita/h'hold) <sup>e</sup>     |                                |                                 |                   |                                   | 2,730,200               |
| 16 annual energy requirements 160 households (15x160 households)                    |                                |                                 |                   |                                   | 436,832,000             |
| 17 annual energy requirements 594 households (15x594 households)                    |                                |                                 |                   |                                   | 1,621,738,800           |
| 18 contribution of urban crop production to energy requir. 160 h'holds (12/16x100%) |                                |                                 |                   |                                   | 29.8%                   |
| 19 contribution of urban crop production to energy requir. 594 h'holds (12/17x100%) |                                |                                 |                   |                                   | 8.0%                    |

Notes: a. From Table 6.1  
b. See Platt 1962  
c. If kg. on cob with sheat.  
d. From Appendix 2, Table A2.1.  
e. See footnote with Table 4.1.

## Appendix 5

### Problems with livestock keeping

Table A5.1 Problems with livestock keeping by type of livestock (%)<sup>\*</sup>

|                             | large<br>livestock<br>33 | small<br>livestock<br>108 | all<br>households<br>121 |
|-----------------------------|--------------------------|---------------------------|--------------------------|
| N (h'holds) =               |                          |                           |                          |
| no problem                  | 9.1                      | 11.1                      | 10.7                     |
| diseases                    | 75.8                     | 71.3                      | 71.9                     |
| theft                       | 24.2                     | 20.4                      | 21.5                     |
| lack of feed                | 27.3                     | 12.0                      | 14.9                     |
| lack of funds/capital       | 15.2                     | 10.2                      | 10.7                     |
| lack of safe drinking water | 24.2                     | 6.5                       | 9.1                      |
| predators                   | 3.0                      | 10.2                      | 9.1                      |
| lack of space               | 3.3                      | 7.4                       | 6.6                      |
| harassment                  | 12.1                     | 2.8                       | 5.8                      |
| lack of market              | 6.1                      | 3.7                       | 3.3                      |
| pests/parasites             | 3.0                      | 1.9                       | 2.5                      |
| lack of labour              | 6.1                      | 0.9                       | 1.7                      |
| nuisance                    | 3.0                      | 0.9                       | 1.7                      |

<sup>\*</sup> There are 20 households with both large and small livestock, hence the N of the column with 'all households' is 121 instead of 141.

Table A5.2: Main problem with livestock keeping by type of livestock (%)<sup>\*</sup>

|                             | N (h'holds) = | large<br>livestock<br>33 | small<br>livestock<br>108 | all<br>households<br>121 |
|-----------------------------|---------------|--------------------------|---------------------------|--------------------------|
| no problem                  |               | 9.1                      | 11.1                      | 10.7                     |
| diseases                    |               | 45.5                     | 61.1                      | 57.0                     |
| theft                       |               | 9.1                      | 7.4                       | 8.3                      |
| lack of feed                |               | 12.1                     | 1.9                       | 3.3                      |
| lack of funds/capital       |               | 6.1                      | 6.5                       | 6.6                      |
| lack of safe drinking water |               | 9.1                      | 1.9                       | 3.3                      |
| predators                   |               | -.-                      | 3.7                       | 3.3                      |
| lack of space               |               | 3.0                      | 3.7                       | 3.3                      |
| harassment                  |               | 3.0                      | -.-                       | 0.8                      |
| lack of market              |               | -.-                      | 0.9                       | 0.8                      |
| pests/parasites             |               | -.-                      | 1.9                       | 1.7                      |
| lack of labour              |               | 3.0                      | -.-                       | 0.8                      |
| nuisance                    |               | -.-                      | -.-                       | -.-                      |
| total                       |               | 100                      | 100                       | 100                      |

<sup>\*</sup> There are 20 households with both large and small livestock, hence the N of the column with 'all households' is 121 instead of 141.

## Appendix 6

### Urban farmers and non-farmers

Table A6.1 Urban farmers and non-farmers: household characteristics (%)

|                                        |                  | urban<br>farmers<br>(N=209) | non-<br>farmers<br>(N=385) |
|----------------------------------------|------------------|-----------------------------|----------------------------|
| household size<br>(number of members)  | 1                | 5.3                         | 14.5                       |
|                                        | 2-4              | 37.3                        | 62.6                       |
|                                        | 5-7              | 44.5                        | 19.0                       |
|                                        | 8 or more        | 12.9                        | 3.9                        |
|                                        | total            | 100                         | 100                        |
| household income class<br>(Ksh./month) | up to 5,000      | 33.2                        | 64.0                       |
|                                        | 5,001 - 10,000   | 36.1                        | 24.6                       |
|                                        | 10,001 - 20,000  | 21.0                        | 8.2                        |
|                                        | more than 20,000 | 9.8                         | 3.2                        |
|                                        | total            | 100                         | 100                        |
| house ownership                        | own house        | 21.5                        | 4.9                        |
|                                        | rent the house   | 78.0                        | 94.5                       |
|                                        | plot keeper      | 0.5                         | 0.5                        |
|                                        | total            | 100                         | 100                        |
| housing density of estate              | high             | 27.3                        | 46.5                       |
|                                        | medium           | 69.4                        | 53.2                       |
|                                        | low              | 3.3                         | 0.3                        |
|                                        | total            | 100                         | 100                        |

Table A6.2 Urban farmers and non-farmers: characteristics of household heads (%)

|                     |                                  | urban<br>farmers<br>(N=209) | non-<br>farmers<br>(N=385) |
|---------------------|----------------------------------|-----------------------------|----------------------------|
| age (years)         | less than 20                     | 1.4                         | 2.7                        |
|                     | 20-29                            | 14.5                        | 37.6                       |
|                     | 30-39                            | 30.9                        | 37.3                       |
|                     | 40-49                            | 30.0                        | 14.6                       |
|                     | 50-59                            | 18.4                        | 5.9                        |
|                     | 60 or more                       | 4.8                         | 1.9                        |
|                     | total                            | 100                         | 100                        |
| sex                 | male                             | 84.7                        | 77.9                       |
|                     | female                           | 15.3                        | 22.1                       |
|                     | total                            | 100                         | 100                        |
| ethnic group        | Kikuyu                           | 38.8                        | 46.9                       |
|                     | Luo                              | 26.3                        | 16.4                       |
|                     | Luhya                            | 12.9                        | 20.1                       |
|                     | Kalenjin                         | 6.7                         | 5.2                        |
|                     | Kisii                            | 7.7                         | 4.2                        |
|                     | Kamba                            | 3.8                         | 3.9                        |
|                     | Asian                            | 1.9                         | 1.3                        |
|                     | others*                          | 1.9                         | 2.0                        |
|                     | total                            | 100                         | 100                        |
| type of residence   | full-time resident               | 92.3                        | 97.4                       |
|                     | regularly absent                 | 7.7                         | 2.6                        |
|                     | total                            | 100                         | 100                        |
| marital status      | single                           | 10.6                        | 22.9                       |
|                     | married monogamously             | 73.6                        | 68.8                       |
|                     | married polygamously             | 8.7                         | 1.8                        |
|                     | divorced/separated/widowed       | 7.2                         | 6.5                        |
|                     | total                            | 100                         | 100                        |
| educational level   | none                             | 1.4                         | 3.1                        |
|                     | primary school, up to Standard 4 | 6.7                         | 5.0                        |
|                     | primary school, Standard 5-8     | 23.9                        | 33.9                       |
|                     | secondary school                 | 45.0                        | 47.0                       |
|                     | more than secondary school       | 23.0                        | 11.0                       |
|                     | total                            | 100                         | 100                        |
| occupational status | regularly employed               | 40.2                        | 41.3                       |
|                     | temporarily employed             | 3.3                         | 5.2                        |
|                     | self-employed                    | 45.5                        | 39.7                       |
|                     | casual labourer                  | 7.2                         | 9.4                        |
|                     | housewife                        | 1.0                         | 1.6                        |
|                     | unemployed                       | 2.9                         | 1.8                        |
|                     | not employed                     | -. -                        | 1.0                        |
|                     | total                            | 100                         | 100                        |

\* Meru (0.5% and 0.8%), Somali (0% and 0.5%), Teso (0 and 0.3%), Maasai (0.5% and 0%), Taita (0% and 0.3%), Mijikenda (0% and 0.3%) and Pare (0.5% and 0%).

Table A6.3 Urban farmers and non-farmers: migration history of household heads (%)

|                                                              |                                   | urban<br>farmers<br>(N=209) | non-<br>farmers<br>(N=385) |
|--------------------------------------------------------------|-----------------------------------|-----------------------------|----------------------------|
| migration status                                             | born in Nakuru town               | 13.0                        | 13.4                       |
|                                                              | immigrant from within Kenya       | 85.1                        | 85.9                       |
|                                                              | immigrants from outside Kenya     | 1.9                         | 0.8                        |
|                                                              | total                             | 100                         | 100                        |
| province of origin<br>(immigrants from within<br>Kenya only) | Nairobi                           | 1.4                         | 2.7                        |
|                                                              | Central                           | 22.6                        | 22.9                       |
|                                                              | Rift Valley                       | 21.5                        | 27.1                       |
|                                                              | Western                           | 13.6                        | 22.3                       |
|                                                              | Nyanza                            | 34.5                        | 19.5                       |
|                                                              | Eastern                           | 5.6                         | 4.9                        |
|                                                              | North Eastern                     | -.                          | 0.3                        |
|                                                              | Coast                             | -.                          | 0.9                        |
|                                                              | total                             | 100                         | 100                        |
| year to come to Nakuru<br>(immigrants only)                  | before 1970                       | 9.0                         | 2.8                        |
|                                                              | 1970 - 1979                       | 28.1                        | 8.0                        |
|                                                              | 1980 - 1989                       | 34.3                        | 29.0                       |
|                                                              | 1990 - 1994                       | 20.2                        | 27.8                       |
|                                                              | 1995 - 1999                       | 8.4                         | 32.4                       |
|                                                              | total                             | 100                         | 100                        |
| main reason to come<br>to Nakuru<br>(immigrants only)        | lack of land in home area         | 1.7                         | 0.6                        |
|                                                              | lack of work in home area         | 0.6                         | 0.6                        |
|                                                              | to look for work / to work        | 79.9                        | 75.7                       |
|                                                              | had relatives in Nakuru           | 7.3                         | 7.0                        |
|                                                              | followed spouse/came with parents | 7.2                         | 10.1                       |
|                                                              | schooling/training                | 1.1                         | 3.3                        |
|                                                              | tribal clashes in home area       | 1.7                         | 2.4                        |
|                                                              | had a plot in Nakuru              | 0.5                         | -.                         |
|                                                              | health reasons                    | -.                          | 0.3                        |
|                                                              | total                             | 100                         | 100                        |

Table A6.4 Urban farmers and non-farmers: general food security issues (%)

|                                       |                              | urban<br>farmers<br>(N=209) | non-<br>farmers<br>(N=385) |
|---------------------------------------|------------------------------|-----------------------------|----------------------------|
| always food enough?                   | yes, always                  | 93.3                        | 84.9                       |
|                                       | most of the time             | 3.3                         | 7.0                        |
|                                       | about half of the time       | 1.9                         | 3.4                        |
|                                       | now and then                 | 1.0                         | 4.7                        |
|                                       | never                        | 0.5                         | -.-                        |
|                                       | total                        | 100                         | 100                        |
| most important food<br>source in 1998 | own urban production         | 5.3                         | -.-                        |
|                                       | urban + rural production     | 9.6                         | -.-                        |
|                                       | urban production + purchased | 30.1                        | -.-                        |
|                                       | purchased                    | 36.8                        | 68.1                       |
|                                       | rural production             | 0.5                         | 1.3                        |
|                                       | rural production + purchased | 17.7                        | 29.9                       |
|                                       | donations + purchased        | -.-                         | 0.8                        |
|                                       | total                        | 100                         | 100                        |

Table A6.5 Non-farmers: reasons for not farming in town by type of farming (%)

|                               |                           | no crop cultivation<br>(N=434) |                | no livestock keeping<br>(N=473) |                |
|-------------------------------|---------------------------|--------------------------------|----------------|---------------------------------|----------------|
|                               |                           | reasons<br>(>100%)             | main<br>reason | reasons<br>(>100%)              | main<br>reason |
| land<br>issues                | no access to urban land   | 85.7                           | 75.6           | 74.4                            | 62.8           |
|                               | plot too far away         | 0.2                            | -.             | 0.2                             | 0.2            |
|                               | land used by someone else | 0.2                            | 0.2            | -.                              | -.             |
|                               | have access to rural land | 8.1                            | 2.3            | 5.7                             | 1.9            |
| lack of<br>other<br>resources | no capital                | 28.6                           | 9.4            | 24.1                            | 10.6           |
|                               | lack of time              | 7.1                            | 4.4            | 6.6                             | 4.4            |
|                               | no labour available       | 1.6                            | 0.5            | 2.7                             | 1.1            |
| legal<br>consider-<br>ations  | harassment                | 1.8                            | 0.2            | 4.7                             | 1.7            |
|                               | not allowed in town       | 0.5                            | 0.5            | 0.2                             | 0.2            |
|                               | disapprove of it          | 3.5                            | 0.9            | 6.3                             | 2.5            |
|                               | landlord disapproves      | 1.8                            | -.             | 5.1                             | 1.3            |
|                               | neighbours complain       | 0.5                            | -.             | 0.4                             | 0.4            |
|                               | theft/insecurity          | 0.9                            | 0.2            | 2.3                             | 1.9            |
|                               | tribal clashes            | 0.2                            | 0.2            | 0.2                             | 0.2            |
| other<br>reasons              | not worthwhile            | 5.3                            | 2.5            | 7.2                             | 5.1            |
|                               | had not thought about it  | 0.9                            | 0.7            | 2.5                             | 2.5            |
|                               | crop failure in the past  | 0.5                            | 0.2            | -.                              | -.             |
|                               | destruction by animals    | 0.9                            | -.             | 0.6                             | 0.4            |
|                               | diseases                  | -.                             | -.             | 1.5                             | 1.1            |
|                               | was not in Nakuru         | 2.3                            | 2.1            | 1.7                             | 1.7            |
|                               | total                     |                                | 100            |                                 | 100            |

## Appendix 7

### Rural farming

Table A7.1 Ownership and use of rural plots (%; N=467)

|                      |                           |      |
|----------------------|---------------------------|------|
| ownership<br>of plot | own land                  | 56.2 |
|                      | family land <sup>a</sup>  | 38.5 |
|                      | landlord                  | 4.9  |
|                      | other <sup>b</sup>        | 0.4  |
|                      | total                     | 100  |
| user of<br>plot      | myself <sup>c</sup>       | 57.2 |
|                      | other family <sup>d</sup> | 32.3 |
|                      | rented out                | 4.1  |
|                      | somebody else uses freely | 1.9  |
|                      | nobody                    | 4.5  |
|                      | total                     | 100  |
| how is<br>plot used? | crops only                | 42.1 |
|                      | crops + livestock         | 49.2 |
|                      | livestock only            | 2.4  |
|                      | idle                      | 6.3  |
|                      | total                     | 100  |

Notes: a Includes 'relative's land' (4 out of 179 cases).  
b Government land (1 case) and friend's land (1 case).  
c In 14 (out of the 267) cases, the plot was partly used by 'other family', in 3 cases it was partly rented out.  
d In 1 case the land was partly rented out.

Table A7.2 Rural farmers and non-farmers: household characteristics (%)

|                                        |                  | rural<br>farmers<br>(N=366) | non-<br>farmers<br>(N=228) |
|----------------------------------------|------------------|-----------------------------|----------------------------|
| household size<br>(number of members)  | 1                | 10.4                        | 12.7                       |
|                                        | 2-4              | 54.4                        | 52.6                       |
|                                        | 5-7              | 28.1                        | 27.6                       |
|                                        | 8 or more        | 7.1                         | 7.0                        |
|                                        | total            | 100                         | 100                        |
| household income class<br>(Ksh./month) | up to 5,000      | 47.8                        | 61.8                       |
|                                        | 5,001 - 10,000   | 32.1                        | 23.1                       |
|                                        | 10,001 - 20,000  | 14.2                        | 10.2                       |
|                                        | more than 20,000 | 5.9                         | 4.9                        |
|                                        | total            | 100                         | 100                        |
| population density of estate           | high             | 67.8                        | 58.3                       |
|                                        | medium           | 30.6                        | 40.8                       |
|                                        | low              | 1.6                         | 0.9                        |
|                                        | total            | 100                         | 100                        |

Table A7.3 Rural farmers and non-farmers: characteristics of household heads (%)

|                     |                                  | rural<br>farmers<br>(N=366) | non-<br>farmers<br>(N=228) |
|---------------------|----------------------------------|-----------------------------|----------------------------|
| age (years)         | less than 20                     | 2.0                         | 4.5                        |
|                     | 20-29                            | 31.6                        | 25.1                       |
|                     | 30-39                            | 32.7                        | 38.1                       |
|                     | 40-49                            | 21.8                        | 17.0                       |
|                     | 50-59                            | 10.6                        | 9.9                        |
|                     | 60 or more                       | 1.4                         | 5.4                        |
|                     | total                            | 100                         | 100                        |
| sex                 | male                             | 85.2                        | 74.4                       |
|                     | female                           | 14.8                        | 27.6                       |
|                     | total                            | 100                         | 100                        |
| ethnic group        | Kikuyu                           | 36.2                        | 56.6                       |
|                     | Luo                              | 24.4                        | 12.7                       |
|                     | Luhya                            | 20.8                        | 12.3                       |
|                     | Kalenjin                         | 7.7                         | 2.6                        |
|                     | Kisii                            | 5.5                         | 5.3                        |
|                     | Kamba                            | 4.1                         | 3.5                        |
|                     | Asian                            | -.-                         | 3.9                        |
|                     | others                           | 1.4                         | 3.1                        |
|                     | total                            | 100                         | 100                        |
| type of residence   | full-time resident               | 95.6                        | 95.6                       |
|                     | regularly absent                 | 4.4                         | 4.4                        |
|                     | total                            | 100                         | 100                        |
| marital status      | single                           | 14.8                        | 24.6                       |
|                     | married monogamously             | 76.4                        | 61.0                       |
|                     | married polygamously             | 4.9                         | 3.1                        |
|                     | divorced/separated/widowed       | 3.8                         | 11.4                       |
|                     | total                            | 100                         | 100                        |
| educational level   | none                             | 0.8                         | 5.3                        |
|                     | primary school, up to Standard 4 | 4.1                         | 7.9                        |
|                     | primary school, Standard 5-8     | 31.0                        | 29.4                       |
|                     | secondary school                 | 48.1                        | 43.4                       |
|                     | more than secondary school       | 15.9                        | 14.0                       |
|                     | total                            | 100                         | 100                        |
| occupational status | regularly employed               | 46.3                        | 32.2                       |
|                     | temporarily employed             | 4.4                         | 4.8                        |
|                     | self-employed                    | 38.6                        | 46.7                       |
|                     | casual labourer                  | 7.7                         | 10.1                       |
|                     | housewife                        | 0.8                         | 2.2                        |
|                     | unemployed                       | 1.6                         | 3.1                        |
|                     | not employed                     | 0.5                         | 0.9                        |
|                     | total                            | 100                         | 100                        |

Table A7.4 Rural farmers and non-farmers: migration history of household heads (%)

|                                                              |                                   | rural<br>farmers<br>(N=366) | non-<br>farmers<br>(N=228) |
|--------------------------------------------------------------|-----------------------------------|-----------------------------|----------------------------|
| migration status                                             | born in Nakuru town               | 9.6                         | 18.9                       |
|                                                              | immigrant from within Kenya       | 90.4                        | 78.0                       |
|                                                              | immigrants from outside Kenya     | -.                          | 3.1                        |
|                                                              | total                             | 100                         | 100                        |
| province of origin<br>(immigrants from within<br>Kenya only) | Nairobi                           | 2.1                         | 2.3                        |
|                                                              | Central                           | 19.2                        | 29.4                       |
|                                                              | Rift Valley                       | 23.2                        | 28.8                       |
|                                                              | Western                           | 21.6                        | 14.7                       |
|                                                              | Nyanza                            | 27.7                        | 19.2                       |
|                                                              | Eastern                           | 5.8                         | 4.0                        |
|                                                              | North Eastern                     | 0.3                         | -.                         |
|                                                              | Coast                             | -.                          | 1.7                        |
|                                                              | total                             | 100                         | 100                        |
| year to come to Nakuru<br>(immigrants only)                  | before 1970                       | 4.3                         | 6.2                        |
|                                                              | 1970 - 1979                       | 14.8                        | 15.8                       |
|                                                              | 1980 - 1989                       | 27.4                        | 37.3                       |
|                                                              | 1990 - 1994                       | 29.2                        | 17.5                       |
|                                                              | 1995 - 1999                       | 24.3                        | 23.2                       |
|                                                              | total                             | 100                         | 100                        |
| main reason to come<br>to Nakuru<br>(immigrants only)        | lack of land in home area         | 0.3                         | 2.2                        |
|                                                              | lack of work in home area         | 0.6                         | 0.6                        |
|                                                              | to look for work / to work        | 81.7                        | 69.8                       |
|                                                              | had relatives in Nakuru           | 7.3                         | 6.7                        |
|                                                              | followed spouse/came with parents | 5.8                         | 15.1                       |
|                                                              | schooling/training                | 2.4                         | 2.8                        |
|                                                              | tribal clashes in home area       | 1.2                         | 3.9                        |
|                                                              | had a plot in Nakuru              | 0.3                         | -.                         |
|                                                              | health reasons                    | 0.3                         | -.                         |
|                                                              | total                             | 100                         | 100                        |

## Appendix 8

### Questionnaire

























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