

## Urban Agriculture in East Africa: practice, challenges and opportunities

By

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### ***Abstract***

*This paper attempts to put into perspective urban agriculture in East Africa. The main themes of the paper are: definition of urban agriculture; characteristics of urban agriculture; role of urban agriculture in employment, income, and food supply; policy and institutional framework for urban agriculture; and urban agriculture and environment. The paper demonstrates that urban agriculture is an important feature of the urban land use system. Since the colonial era, urban agriculture remains outside the urban land use system. Therefore, the sector does not enjoy the much needed institutional support. Although Tanzania has integrated urban agriculture in the urban land use system, it remains officially excluded from Kenyan urban land use system. Despite the fact that it is not integrated into the urban land use system, it is an important feature of the urban economy. It is evident that urban agriculture makes important contribution to employment, income and food supply. It is an important source of income and food supply for the commercial and poor urban farmers respectively. Due to environmental degradation and heighten poverty, there are health risks associated with urban agriculture in hazardous areas or use of unsafe water. The urban economies can greatly benefit from urban agriculture, if all the governments of East Africa can develop a policy and institutional framework on the sector. This would ensure enhanced agricultural productivity and safety of the produce.*

## **I. Introduction**

East African countries have registered rapid rate of urbanisation (6-8 per cent) during the last four decades. This has occurred against declining economic growth and weakening institutional and physical infrastructure. As a result, the urban centres have witnessed heightened poverty and massive growth of slum and squatter settlement. In the case of Kenya urban poverty is estimated at 60 per cent, while those living in slum and squatter settlements are estimated at 70 per cent in both Nairobi and Dar es Salaam. Massive growth of slum and squatter settlement has contributed to environmental degradation.

Since the 1970s, urban agriculture has recorded significant growth. The following key factors have accelerated the growth of urban agriculture as a survival strategy by the poor urban farming families: rapid urbanisation, ineffective agricultural policies, crippled domestic food-distribution systems, constrained public spending and subsidies, wage cuts, soaring inflation and rising unemployment, plummeting purchasing power, and lax urban land use regulations or enforcement (IDRC, 1994). Globally, about 200 million urban dwellers are now urban farmers, providing food and income to about 700 million people (DGIP/UNDP 1993).

The growth of urban agriculture has taken place in the face of socio-economic prejudices in form of planning standards and regulations that exclude agriculture from urban land use systems. Although urban agriculture is tolerated in Kenya, town planning legislative provisions do not recognise urban agriculture as a legitimate land use that should be provided for in the urban areas. In the case of Tanzania, efforts have been made to integrate urban agriculture into the urban land use system, but little has been done to actualise the legislative provisions. Therefore, it has not been possible to harness the full potential of urban agriculture in employment, income and food supply.

## **II. The definition of urban agriculture**

Although authors differ in defining urban agriculture, the following key features characterise the activity. (1) Urban agriculture involves crops and livestock production, but it may also include agro-forestry and fuel production. (2) Urban agriculture is practised both within the urban boundary and its periphery. Madden and Chaplowe (1997) defines urban agriculture as the practice of crop cultivation and livestock raising within the boundaries or the immediate periphery of a city. The choice of what to produce and how to produce it is determined by the culture, traditions, market, water supply, rainfall, climate, exposure to sun, soil condition, plot size and distance from home. Family and individual resources, land availability and location are critical determinants of the type of urban agriculture practised. UNDP (1996) defines urban agriculture as an industry that produces, processes and markets food and fuel, largely in response to daily demand of consumers within a town, city or metropolis, on land and water dispersed throughout the urban and peri-urban area, applying intensive production methods, using and recycling natural resources and urban wastes, to yield a diversity of crops and livestock. Urban agriculture is divided into five broadly defined farming systems: aquaculture, horticulture, animal husbandry, agro-forestry and other urban farming activity.

## **III. Characteristics of urban agriculture in East Africa**

It is difficult to fully characterise urban agriculture because of its long history and varied definitions. The following key features can help discern urban agriculture in East Africa: (1) origin and history of urban agriculture; (2) commodities grown or kept; (3) location where urban agriculture is practiced; (4) who practices urban agriculture (poor or rich); and (5) the gender roles in urban agriculture. The history of urban agriculture in Kenya dates back to 1899 when the railway workers mainly from India started the practice in the mainland towns. The Indian urban farmers sold the surplus produce to European settlers. During the colonial era, African population in the urban centres was highly restricted. At the same time, the colonial regime strictly enforced planning regulations that prohibited urban agriculture in certain places, for example roadside and public open spaces. After independence urban agriculture witnessed rapid growth despite restrictive urban planning and management regulations. However, it was only during the past 40 years that the African population was permitted to reside permanently in urban areas in Kenya.

Since then, the growth of the urban population has consistently far surpassed forecasts. This has been paralleled by an expansion of informal and farming activities and an increasing ruralization of the cities: the boundaries between the city and the countryside have become clouded.

Urban farming is undertaken by two groups, the traditional farmers, who have been engulfed by urban development, and recent migrants. During the last two decades, Kenyan urban centres have witnessed haphazard changes of boundaries. The boundary changes have included areas that are predominantly rural in character with agriculture as the dominant land use. The second major group of urban farmers comprises urban migrants and their families. Although these urban farmers come from all income groups, the poor dominate. The majority of urban households in Kenya are unable to feed themselves adequately from their earnings, and those who are able cultivate land in backyard spaces near their dwelling, on roadside verges, or on other publicly owned vacant land. Subsistence farming is an economic imperative for them. Hence, satisfaction of basic needs is the primary motivating factor governing their behaviour, rather than profit making and capital accumulation. In contrast with better-off households who tend to farm on private land mostly their backyards, the very low-income groups tend to use public land.

Most of the Kenyan urban farmers (77 per cent) produce mostly for household consumption. In Nairobi, over 50 per cent used the entire amount harvested to feed their families or dependants. The pattern that emerges is of a relatively simple self-sufficient peasant economy, based on petty commodity exchange existing in the larger urban centres (IDRC, 1994). Freeman (1991) found that most of the food produced on urban plots is reserved mostly for the cultivator's immediate family and/or dependants. Since most of the produce is for domestic consumption, it does exemplify the important role of urban agriculture in meeting food security needs of the farmers.

Urban agriculture is found on sites of various types. Madden & Chaplowe (1997) states that urban agriculture is most commonly located in spaces in and around the home. In addition to household setting, urban agriculture also occurs in large tracts of public or private land that remain underdeveloped for landscaping, urban extension, or because they are unsuitable for development. Lado (in IDRC 1994) shows that urban agriculture is practised mainly on private

residential land (32 per cent), followed by roadside verges (29 per cent), river banks (16 per cent) and other public lands. Similar trends have been observed in Dar es Salaam and Kampala (Mwangi, and Foeken, 1996; Sawio, 1993; and Smith *et al.*, 1996). According to the above data, urban agriculture is practised mainly on roadside and river bank sites with high risks of pollution of the produce.

The role of women in household food delivery exemplifies their central role in urban agriculture. Most urban farmers in Kenya are women (56 per cent), with the proportion of women being higher in the larger towns (62 per cent in Nairobi). Only in Kitui were there fewer women than men among urban farm workers (47 per cent). Among household heads engaged in urban farming, women form an even higher proportion (64 per cent), whereas men were the large majority among hired urban farm workers (82 per cent).

Urban agriculture involves crop and livestock production of different kinds. Crops include: vegetables, maize, beans, millet, sugar cane, bananas, while livestock include poultry, dairy cattle, sheep, goats, pigs and fish farming both for domestic consumption and sale. A survey conducted by IDRC in Kenya (1994) states that poultry was the most common livestock in all towns, though goats, sheep and cattle were fairly numerous in the smaller towns. Very few urban households keep fish, pigs and bees. Nairobi city had an estimated 23000 cattle in the town, although most belonged to medium-high income dairy farmers. Similarly in Dar es Salaam, commercial dairy farming is practised mainly by middle-high income urban households. Livestock keepers in the other towns usually let their animals roam freely, particularly during the rainy season, eating grass or whatever they can find.

The level of investment in urban farming is very low, and the level of agricultural inputs correspondingly so. For example in Kenya, only 11 per cent of urban farmers indicated that they used fertilizers, while 30 per cent use manure. About 50 per cent of the urban farmers used manure from their own animals, but close to a half obtained it through informal gift or barter from friends or relatives while only 2 per cent bought it. Chicken droppings were used by 16 per cent of urban crop farmers with 76 per cent of the farmers getting it from their own chickens.

However, in Nairobi, unlike other towns, over 50 per cent of the farmers acquired it through informal barter. Similarly, compost was used by 25 per cent of the urban farmer sample; almost all (96 per cent) said they produced it themselves, except in Nairobi where it was even found in the market and Mombasa where it was acquired by barter. Mulch was employed by 19 per cent, almost all of whom (90 per cent) had their own source, except in Nairobi, where it was exchanged.

#### **IV. Employment, income and food supply**

High rates of urbanisation associated with deteriorating economic performance in both Kenya and Tanzania have heightened urban poverty. In both countries, urbanisation rate has consistently been in the range of 4-10 per cent per annum during the last three decades while annual economic growth rates had been put at below 4 per cent. These key factors have accelerated the growth of urban agriculture as a survival strategy by the poor urban households. Commercial urban agriculture, spurred by increasing urban market, has also grown as urban population seek alternative income and employment. The role of urban agriculture has become even more critical in Kenya because of increasing urban poverty situation. It is estimated that about 60 per cent of the Kenyan population live below the poverty line.

Structural adjustment policies has led to persistent unemployment, retrenched civil service, newcomers added yearly to the local labour pool, sheer population growth, women at home resorting to urban agriculture, and a growing urban demand for abundant, regular, and cheap supplies of good-quality food has led to rapid growth of urban agriculture in Dar es Salaam. Tanzanian gross domestic product (GDP) declined in real terms throughout the 1980s, from an average annual growth rate of 5.1 per cent to less than 2.0 per cent (DSM/ARDHI 1992).

It is evident that urban agriculture in Tanzania plays an important role in employment creation, income and food supply. The sector has also registered impressive growth. According to the 1988 census urban agriculture was ranked as Dar es Salaam's second largest employer, after small traders. Urban agriculture occupied 11 per cent of the population aged 10 or more, but 20 per

cent of those employed, turning out about 100,000 t of food crops annually (DSM/ARDHI 1992). The total area under crops reached 33,872 ha (over 500 ha under vegetable crops). Satellite imagery reveals that as much as 23 per cent of the city region is used for agricultural production (DSM/ARDHI 1992). Data on other Tanzanian cities show a similar, if not larger, incidence of urban agriculture (Mosha 1991; Mvena et al. 1991). Tanzania's Ministry of Agriculture and Livestock Development and Livestock Office of Dar es Salaam's City Council show that both livestock numbers and cultivated area grew steadily between 1985 and 1989; chickens from 510 789 to 793,441, pigs from 8,601 to 15,658, goats from 2,617 to 6,218, and dairy cattle from 4,200 to 8,517 (Mosha 1991). In 1993 dairy milk produced in Dar es Salaam was estimated at 2.2 million USD and generated a net overall annual income equivalent to 8.1 million USD. In Kenya, it is estimated that urban agriculture produces 25.2 million kg of crops worth 4 million USD and 1.4 million livestock worth 17 million USD (Lee-Smith and Memon).

In Dar es Salaam in 1980, 44 per cent of low-income earners had farms, but in 1987 some 70 per cent of heads of household engaged in some farming or husbandry (Malilyamkono and Bagachwa 1990, cited by Sawio 1993); another study found that nearly 50 per cent of workers and 59 per cent of all residents of 287 households in Dar es Salaam reported having farms in 1987/8 (Tripp 1989). A three-stage survey of 1576 urban households (57 per cent in low-income groups) in six Kenyan cities found that 29 per cent grew part of their food and 17 per cent raised livestock in the urban area where they lived in 1984/5 (Lee-Smith et al. 1987).

Available data on urban agriculture in Kenya (IDRC, 1994) indicates that urban agriculture makes an invaluable contribution to national development. It is estimated that 25.2 million kg of crops worth about 60.9 million KES (about 4 million USD in 1985), were produced in urban areas in one season. There were an estimated 1.4 million head of livestock, worth about 259 million KES (about 17 million USD), kept in all towns in Kenya at the time of the survey. In fact, these livestock represent only 47 per cent of the total number of animals that were kept or disposed of in various ways. This represents a considerable contribution to national economic production, especially if it is assumed that most urban areas have two crops per year.

In Kampala 36 per cent of the households surveyed within a 5-km radius of downtown engaged in some form of agriculture. Those engaged in urban agriculture said that even if they were offered jobs whose cash remuneration was equivalent, they would not stop farming. Kampala produces 70 per cent of all poultry products it consumes (Maxwell, 1994). In Kenya 77 per cent of urban farmers produce entirely for their own consumption. In Nairobi, over 50 per cent used the entire amount harvested to feed their families (Lado, 1990). In Dar es Salaam, nearly 50 per cent of 260 intra-urban producers reported that urban agriculture contributes 20-30 per cent or more of the households' food supply (Sawio, 1993). In Kampala, 55 per cent of 150 producers obtained 40 per cent or more, and 32 per cent obtained 60 per cent or more of their household food from their own urban garden (Maxwell and Zziwa 1992).

Case study survey reveals that commercial urban agriculture plays an important role in urban economy. It is an important source of income and employment. The investment capital is comparatively low for both pig and poultry farming and one can get good return within a period of two to three years. A 300 unit poultry farm either for laying eggs or chicken (a minimum economic unit) would require 27m<sup>2</sup> space. It is estimated that a farmer requires an initial capital of US\$ 980 and 1870 for chicken and eggs production respectively. A 300 unit poultry farm generates a net profit of about US\$ 120 after every six weeks. To be able to undertake viable pig farming involving a minimum of 5 breeding mothers, a farmer requires an initial capital of about US\$ 2933. Such a pig farm would require about 29.7m<sup>2</sup> space. The feeding mothers are expensive (US\$ 187), but each mother delivers about 10 piglets 2.5 times a year. A pig matures after 6 months, so within one year a farmer can get 100 mature pigs from 5 breeding mothers. Each pig earns a net profit of US\$ 27. Therefore, a pig farmer with 5 breeding mothers can earn a net profit of US\$ 2667 per year (Mireri, 2002).

In addition, urban agriculture is an important source of direct and indirect employment. Apart from family labour, low skilled labour are employed by the commercial urban agriculture. Poultry farmers in Nairobi city are estimated at 1250, while contract pig farmers within and around Nairobi city are 240. As urban agriculture is not officially recognised in the Kenyan land use system critical support services are lacking in the city. In addition the existing credit and

investment support services mostly favour farmers with initial capital, adequate and secure land holding. The existing credit and investment support services, favours mostly farmers with initial capital, adequate and secure land holding. Such farmers can source the critical technical services, quality feeds and other inputs and adapt efficient farm management systems (Mireri 2002).

## **V. Institutional and policy framework for urban agriculture**

Effective and efficient institutional framework forms the basis against which an activity can develop. Urban activities are governed by various legislative provisions, for example Local Government Act, Physical Planning Act, Public Health Act and Environmental Management and Co-ordination Act. In addition, each local authority is expected to prepare its own by-laws in line with specific legislative provisions. The various Acts of Parliaments and the by-laws define the authorized land uses within the local authority and framework for undertaking such activities. Until the 1990s urban agriculture was excluded from the urban land uses in the East Africa. The exclusion of agriculture from the urban land use system is caused in large measure by the colonial and successive independent governments' influence on urban planning practice in the region. Although Tanzania has made concrete efforts to integrate agriculture in the urban land use systems, little effort has been made in Kenya. Even though Tanzania has categorized agriculture as an urban land use, there is no evidence that the revised legislative provisions are being enforced. Despite the fact that agriculture is excluded from urban land use system in Kenya, the practice is tolerated and the by-laws permit it under stringent conditions.

The genesis of many of the today's main urban centres in Kenya can be attributed primarily to either administrative considerations or the construction of railways or both. Several of these urban centres were gazetted as townships under Townships Ordinance of 1903, as centres of colonial authority and rule and as 'islands of health' and security, over which strict sanitary control could be maintained under the Township Rules provided in the ordinance. The boundaries of these urban areas were carefully defined by the early administrators to avoid existing areas of subsistence farming and settlement. In the upper-middle-income suburbs of cities such as Nairobi and Nakuru, residential areas were laid out on the basis of the garden-city

model, with large quarter-acre (0.1 ha) allotments and tree-lined avenues. Frequently, these salubrious neighbourhoods were protected from competing urban uses by buffer zones of public open space. In this new urban setting, the presence, on a permanent basis, of the indigenous African population, let alone their traditional means of livelihood, proscribed and carefully policed (IDRC, 1994).

The socio-cultural biases against urban agriculture are often strong. Some arise from the outdated, European 'city beautiful' views of what a city should be; some are related to local cultures. They often pertain to views about aesthetics, efficiency, hygiene and modernity in general. The biases tend to be persistent, particularly when they become institutionalised through policies, laws, regulations and enforcement mechanisms. The negative attitudes of critical actors are particularly constricting. For instance, when planners and economists regard urban agriculture as a marginal, informal-sector activity, the bias spreads to the market and credit agents, to legislators and the general population. The result is insufficient official support and private financing and policies and legislation inimical to farming in cities (UNDP, 1994).

The colonial administration officially designated agriculture as a rural land use activity. The independent Kenya inherited this planning policy. The Physical Planning Act (1996) is the most recent government policy initiative on urban planning. Section 16 of the Act states that a regional physical development plan may be prepared by the Director with reference to any Government land, trust land or private land within the area of authority of a county council for the purpose of improving the land and providing for the physical development of such land, and securing suitable provision for transportation, public purposes, utilities and services, commercial, industrial, residential and recreational areas, including parks, open spaces and reserves and also for the making of a suitable provision for the use of land for building or other purposes. Section 29 of the Act empowers local authorities to ensure the proper execution and implementation of the approved physical development plans. The Act clearly indicates the land uses that should be in the plan and systematically excludes agriculture from the urban land use system.

Planning in Kenya is still greatly influenced by western countries' planning practices. In the western countries urban agriculture is excluded from planned urban land uses. However, an increasing number of African countries are recognising the importance of urban agriculture. IDRC (1994) states that today in western countries, urbanism excludes agriculture, except as a recreational activity or in times of crisis. However, there is a shift in some African countries where urban agriculture is increasingly gaining government support. Madden & Chaplowe (1997) reports that urban agriculture has been incorporated into the zoning plans for the new capitals of Tanzania.

The 'city beautiful' ethos among planners in Nairobi continues to lay stress on the expansion and preservation of parks and boulevards (Freeman, 1991). The traditional planning philosophy laid emphasis on definite urban form, function and aesthetics. Urban agriculture is perceived to threaten the key features of a classical city. Therefore, Kenyan urban development plans do not provide for agriculture as a distinct land use. Although, urban agriculture is officially excluded from urban land use, previous researches show that local authorities do not aggressively enforce the planning requirement. The local authorities are tacitly accepting urban agriculture as an integral part of urban economy.

The case of Kisumu Municipality shows that it is still governed by by-laws that were gazetted in 1954 long before the country attained independence. The by-laws do not recognise urban agriculture as a legitimate land use within the Municipality although about 80 per cent of the municipality is rural in character with agriculture as the dominant land use. The sections of the by-laws that authorise urban agriculture are so stringent that most urban farmers would not meet them if they were fully enforced. A few examples would suffice to demonstrate that most of the urban farmers would not meet the requirements of the by-laws. By-law 60 states that no licensed purveyor of milk shall sell milk for human consumption in the municipality unless such milk has been pasteurised, transferred, immediately after pasteurisation, to a sterile approved container and therein sealed to the satisfaction of the Board. By-law 294 states that no person shall keep any domestic animal within the Municipality in such a manner or in such circumstances that it may be or become a nuisance or injurious to health. By-law 296 states that no person shall keep

within any house, building, or other premises or in the vicinity thereof, any noisy domestic animal which shall be or may cause a nuisance to the residents in the neighbourhood. By-law 300 states that the written permit of the Board shall state the maximum number of domestic animals which may be kept, and may also prescribe conditions under which such written permit has been granted.

Kisumu municipality by-laws do not make direct reference to crop production, which exemplifies its legal exclusion from the urban land use functions. The restriction of crop production can be dealt with by by-law 309 (c) which states that the occupier of any premises and if the premises be unoccupied, the owner of such premises shall not permit his premises to become overgrown with long grass or other vegetation. The continued existence of the stringent by-laws exposes the urban farmers to potential threat of harassment and denies them access to critical services and credit facilities.

## **VI. Urban agriculture and environment**

Urban agriculture is linked to the environment at several levels. (1) Urban agriculture demands resources, which may be scarce for example treated domestic water supply. This may lead to serious resource use conflicts and use of unsafe water for farming. (2) Lack of suitable land for various categories of urban farmers may cause farmers to farm on hazardous sites with serious health implications. (3) Lack of institutional support may lead to production of unsafe agriculture produce. (4) Urban agriculture is a unique land use in the sense that it is practised in an environment with intense land use competition, which require careful integration to minimise land use conflicts. For example urban agriculture in residential neighbourhood must take cognisance of the pollution and health risks that may result from the practice. (5) Finally, urban agriculture generates wastes that must be efficiently managed to safeguard the life of the urban residents.

The rapid rate of urbanisation and massive growth of slum and squatter settlements have exposed urban centres to increased rates of pollution of land, air and water resources, thus

heighten the risks of contamination of urban agriculture produce. Madden and Chaplowe (1997) observes that problems with urban agriculture arise from its close proximity to dense human populations sharing air, water and soil resources. In some cases, urban cultivators divert municipal water supplies meant for other uses in the city, contributing to water shortages. Also, there is great risk of chemical contamination in dense urban settlements. Soils near the roadways and industries risk heavy metal pollution from airborne lead and cadmium from gasoline exhaust. Intensive livestock rearing is another form of urban agriculture that risks harm to urban residents, leaching of solid and liquid waste can lead to ground water contamination. Sometimes animal refuse can also carry germs that cause diseases transmitted through milk and meat, such as tuberculosis and anthrax. Other concerns pertaining to livestock in dense urban settings are unpleasant odours, noise pollution, traffic jams and hazards. Another health concern in urban agriculture arises with the un-regulated use of uncomposted solid waste and untreated waste water to irrigate crops or to feed livestock. This practice can cause serious food contamination and increase the risk of illness among farm workers. Recycled wastes sometimes contain toxic chemicals and industrial wastes that are hazardous to human health if transmitted through food.

Most urban farmers rely on rainfall while others particularly on river banks use polluted river or sewage water for farming. Polluted water affects the quality of farm produce, while heavy reliance on rainfall affects farm productivity because of weather variability. Also, most surface water resources are unsuitable for urban agriculture because of high levels of pollution. Intensive commercial urban agriculture cannot depend on unreliable rainfall. Water shortages in a number of urban centres have been blamed on use of domestic water supply for irrigation in commercial urban farmers. Thus, some commercial agricultural activities compete with city residents for the scarce water resources. Almost half (45 per cent) of Kenyan urban farmers water their crops and 71 per cent of these used piped water. In Nairobi city 66 per cent of the urban farmers water their farms of which 87 per cent use piped municipal water supply.

## **VII. Conclusion**

The East African countries have witnessed high rate of urbanisation in the range of 6-8 per cent during the last four decades. This has been associated with economic stagnation, worsening poverty, massive growth of slum settlement and environmental degradation. Urban agriculture has during the same period registered rapid growth as an important source of food for the urban poor as well a viable commercial venture for the middle and high income households. During the colonial period urban agriculture was excluded from formal urban land use and could only be authorised under stringent conditions. Since independence, little has been done to integrate urban agriculture as an integral part of urban land use system. Although Tanzania has integrated the sector into urban land use system, the full effect of the initiative has not been realised. As a result, urban agriculture continues to suffer from official policy bias as well as socio-cultural practices that have been informed by colonial influence.

Practice of urban agriculture on road reserves, river banks and other hazardous areas may contaminate the produce with serious health implication. Also, urban agriculture competes with other urban land uses for scarce resources, for example domestic water supply. In addition, demand for water causes poor urban farmers to destroy conventional sewerage systems to access waste water for irrigation, which causes environmental degradation and increased infrastructure maintenance cost. Safe urban agriculture provides an important opportunity for the farmers to gainfully participate in national development. In order to realise the full potential of urban agriculture, there is need to develop a policy and institutional framework for the sector. This would enable urban farmers unlock critical technical and financial support services. Also, urban agriculture would be carried out in designated and safe places. This would be mutually beneficial to the farmer as well as the unsuspecting consumer who would be guaranteed of safe produce.

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