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**Cities Feeding
People:
Urban Agriculture and City
Planning
in North & South
An IDRC Panel (papers)**

**Habitat 94
World Congress Conference
Edmonton, Alberta, Canada
September 20, 1994**

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**Urban Agriculture and City Planning
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Habitat 94

**New Frontiers in Housing & Planning
Canadian Institute of Planners &
International Federation for Housing &
Planning**

***Session D1, Edmonton Convention Centre
September 20, 1994, 15:30 - 17:00
Edmonton, Alberta, Canada***

**Urban Environment Management
Division of Environment and Natural Resources
International Development Research Centre,
Canada (IDRC)**

Tuesday, September 20, 15:30-17:00, Session D1

Cities Feeding People: Urban Agriculture and City Planning in the North & the South (90 minutes).

This panel will discuss and compare the recent evolution of food production within and fringing cities of the North and the South, its current significance (land use, practitioners, consumers, share of urban food supply, market value). It will present recent changes in official recognition, regulation and promotion of urban agriculture. Also, it will address important challenges which the city planning community can assist to overcome for urban agriculture to render our cities more sustainable. A 10-minute introduction, plus four 15-minute presentations, followed by a 20-minute question and answer period. Publications and handouts available for distributions or sale.

"Urban Food Production: A Survey of Evolution, Official Support and Significance (with special reference to Africa)"*

Chairperson: Luc J.A. Mougeot, Senior Program Officer, from the International Development Research Centre (IDRC), Ottawa, Ontario, Canada (fax: 613-567-7749).

"Promoting Urban Agriculture: A Strategy Framework for Planners in North America, Europe and Asia"*

Speaker: Paul Sommers, Tropical Horticulture Consultant, and Jac Smit, President, both from The Urban Agriculture Network, Washington, D.C. USA (fax: 202-986-6732).

"Urban Agriculture and The Sustainable Dar-es-Salaam Project, Tanzania"*

Speaker: Camillus Sawio, UNCHS-IDRC Research Project Coordinator, from the Department of Geography, University of Dar-es-Salaam, Tanzania (fax: 255-51-43038/46718).

"Une Histoire des Deux Villes: Comparing Canadian Community Gardening Programs in Montreal and Toronto"*

Speaker: Sean Cosgrove, Design Consultant, from the Toronto Food Policy Council, and Board Member of American Community Gardening Association, Toronto, Canada (fax: 416-393-1357).

"Urban Agriculture: Can Planners Make a Difference?*"

Speaker: Timothy Greenhow, Urban/Regional Planner, from SWEDEPLAN - International Divisional of Sweden's National Board of Housing, Building and Planning, Stockholm, Sweden (fax: 46-8-644-4689).

* Opinions expressed in the papers do not necessarily represent the views of the institutions to which their authors are affiliated.

Luc J.A. Mougeot, International Development Research Centre

Presentation to Habitat 94 in Edmonton, September 20, 1994

**URBAN FOOD PRODUCTION:
A SURVEY OF EVOLUTION, OFFICIAL SUPPORT AND
SIGNIFICANCE (with special reference to Africa)**

Introduction

1. Urban agriculture (UA) or farming can be defined, consensually, as the growing of food and nonfood plant and tree crops and the raising of livestock (cattle, fowl, fish, and so forth), both within (intra-) and fringing (peri-) built-up urban areas (Ganapathy, 1983; Ford Foundation 1993, as per Siau and Yurjevic, 1993: 45). Horticulture is only one of the many farming systems which UA may embrace in any given city. Although UA is not confined to the production of food only, it is particularly being recognised and addressed in most of the South and in at least some of the North countries as an integral part of urban food systems; other components include: supply from rural-producing areas, urban storage and transportation, processing and marketing, distribution and consumption of food in urban areas.
2. Vennetier's 1958 survey of Pointe Noire, Congo, is often credited for having launched a new field of inquiry into urban farming in West Africa, and beyond: a sample of 1 013 households enabled him to estimate that UA then was being practised by 30.6% of Pointe Noire's population (Vennetier, 1961: 84). Ganapathy (1983) submitted a short, though inclusive, definition of the concept; Smit and Nasr (1992) developed a very comprehensive typology of farming systems, observed in 40 cities and towns in 18 countries. Sawio's dissertation (1993) reviewed the research on the rapidly evolving field of city farming in anglophone Africa.

Evolution of Urban Agriculture

Pre-Industrial Revolution City Farming

3. The coupling of “urban” and “agriculture” into a single expression may seem contradictory, but in fact UA as a basic urban function is nothing new (Mlozi, 199?: 105-106; Lee-Smith and Memon, 1994: 70). Archaeological fieldwork and airborne imagery are unveiling massive and ingenious earth and waterworks, within and fringing the more advanced urban settlements achieved by ancient civilizations. Many of these facilities and infrastructure were used wholly or in part to produce food, feed, and fodder crops; fuel, building, shade, fencing, windbreak trees and shrubs; ornamental, medicinal, and other utilitarian plants; and livestock for food, materials, traction, transport, and trade, sacrifices and status.
4. Uruk, the most important city in fourth-millennium Mesopotamia (possibly 50 000 people), extended over 1100 acres, a third of which covered with palm groves; the large majority of its working adults were engaged in primary agricultural production on their own holdings, on allotments of land from temples or as dependent retainers on large estates; they also had other occupations (Adams, 1994: 18). The Neolithic Egyptian settlement of Knossos developed mixed farming (wheat, barley, lentils, sheep, goats, pigs and some cattle); the Minoan town spreaded over 75 hectares with pop. 12 000; it had isolated farms on its edge (Rodenbeck, 1991: 124, 129). Minoan palaces had a central court around which were grouped storage and production areas; rulers probably controlled much of the agriculture in the surrounding region, about 1000 hectares (Warren, 1994: 46, 51).
5. Under Persian emperor Darius, walled gardens or *pairidaeze* (“paradises”) were associated with hydraulic facilities, thereby exploiting more fully water resources. In Thebes, capital of the New Kingdom 1500 BC, walled gardens of prosperous Egyptians provided fresh fruit for the household (including indigenous vine, pomegranate, imported apple and almond), sycamores, date and down palms, fresh fish from lotus-covered pools; larger gardens with water tanks had ducks (Jellicoe, 1989: 25). In the capital city of Akhenatan, Egypt, gardens were everywhere , with additional spaces reserved to storage, underground cellars, breweries and animal keeping (Courtlandt and Kocybala, 1990: 126).
6. Water shortages may have curtailed urban horticulture in ancient Greece, but ingenious use was made of it wherever some was available. On Crete, the large inland city of Eleutherna important until the Late Roman period, had a vaulted aqueduct

taking water from cisterns under the acropolis and to extensive cropfields terraced down along the limestone spur on which the city was erected; some of these terraces are still cultivated (Rodenbeck, 1991: 91). Greek city-states were self-supplied with goat milk and olive-oil fuel for house lighting.

7. Vast agricultural drainage schemes were revealed on the Roman imperial sites of Timgad in Algeria and of Volubilis in Morocco. Near the mouth of the Tiber River, in the densely settled ancient Roman port of Ostia, a planned complex of garden houses, surprisingly similar to modern counterparts, was erected in ca. 128 AD. The complex was more likely built for middle and lower classes, included 40-100 apartments and probably housed 400-700 people; all that remains of original gardens are six fountains from which residents drew their water (Watts and Watts, 1994: 86, 88, 89).
8. The Roman coastal city of Cosa, 140 km north of Rome, at its height in 100 BC, had its harbour linked by artificial and natural channels to a commercial fishery lagoon fishery, of which product was dried, pickled or salted and shipped in amphoras. The fish farm had fish tanks more than 100 m long, covering about one hectare of the west end of the adjacent lagoon. Some of the catch of eels, grey mullet, sea bass, gilthead and sole would have been eaten by the local population. A modern lagoon fishery is in operation at the nearby town of Orbetello (McCann, 1994: 95-96). Elsewhere, Andalusian cities had houses surrounded by gardens and orchards. Cities on the Indus River, such as Harappa and Mohenjo Daro, discovered from under the shifting muds of the Indus, once were specialized agro-urban centres.
9. Of Medieval Europe Susan Reynolds (1984: 200) writes: "The provision of food in sufficient quantity, sufficiently fresh, and at a reasonable price, was a constant anxiety...". Crop-rotation systems were being tested in farms and fields of monasteries, walled cities, and castles. Medieval tapestries suggest ladies' castle gardens included herbs on raised beds and rabbitries (Jellicoe, 1989: 34). A fifteenth-century College of the Vicars Choral in the city of York, England, had buildings surrounding a garden; behind them lay orchards (Addyman, 1994: 117-118). Nearly perfectly preserved medieval Novgorod in Russia is depicted in a seventeenth-century icon, showing well-spaced housing, gardens and orchards, within its outer and inner walls (Yanin, 1994: 123).
10. In North America's Mississippian culture (peak 1050-1250 AD), intensive riverine horticulture supported what Burland (Coe et al. 1986: 57) qualifies as true

preindustrial cities in the rich alluvial valleys of the Mississippi, Ohio, Tennessee, Arkansas, and Red rivers and tributaries. One of them, the 10 000-people city of Cahokia in Illinois, was the largest pre-Columbian urban centre north of Mexico. Also in the middle course of the Mississippi, the Moundville site (population 3 000) in Alabama contains borrow-pits apparently used to store live fish, part of the food needed to support its people (Coe et al. 1986: 56). In Central America authority and organisation from major centres was exerted to terrace steep hills and drain swamps into cropfields on the edge of Nohmul; this was a large Late Preclassic city near the Belize-Mexico border. At the city of Edzna, on the coastal plain of Campeche, waterworks of staggering proportions (2.25 million cubic m of water storage) supported a highly organised agricultural economy (Hammond, 1994: 132).

11. Four thousand years ago in the pre-Olmec Valley of Mexico, small towns on stone-faced terraces, such as Tlatilco and Ticoman, farmed vegetables and raised dogs and turkeys, (Burland 1976: 15–18). The Aztec state was partly dependent on food production within and fringing the metropolises of Teotihuacán and the capital city of Tenochtitlán, south-west of the former and on a man-made island built on Lake Mexico (Anton 1993: 116). In 1519 Bernal Diaz marvelled at the agricultural nature of the city he discovered, an island capital extending over 20 square miles, with five times the population of Henry VII's London at the time (Redclift, 1987: 109). Teotihuacan itself at the height of its power, 500 BC was larger (more than 4000 buildings and 50-100 000 people) than imperial Rome (Millon, 1994: 138); Millon's maps of Teotihuacán (population 125 000–250 000) clearly indicate *chinampas* in one section of the city: these were "rectangular raised-beds anchored with planted fences of willows, filled in and periodically fertilised with piles of marshy vegetation removed through canal-cutting, topped with canal-bottom mud." (Coe et al. 1986: 104).
12. Chinampas carried fruits, vegetables, trees and houses, supplied most of the produce consumed in the city at the time of discovery and still supplied some vegetables as late as 1900. Three harvests were possible, with transplanting from reedbeds, animals were kept and their manure and that of humans applied to organic gardens (Redclift, 1987: 109-110). Highly fertile and productive *chinampas* were found in Xochimilco (surviving to the present), towns on southern shores of Lake Xochimilco, and in most of the island of Tenochtitlán–Tlatelolco. A plan to recover the Xochimilco region has prompted new interest for the chinampa economy which has survived to the present (Millon, 1994: 139; see also Canaval, 1992). A 15-km long dike, built across Lake Texcoco, protected *chinampas* from rising saltwater in the rainy season (Coe et al.

1986: 144, 146, 149). An aqueduct raised water to irrigate a hilltop orchard in NE of Tenochtitlan (Haas, 1993: 22). The well-spaced layout of outer house mounds probably enabled each home to have its own garden (Burland, 1976: 40). In Haas' *Gardens of Mexico* (1993: 22) a nineteenth-century painting depicts a woman in her central Mexico City roof garden, attended by her mestizo and native maids, a water seller approaching the group. Haas finds that secure rooftop potted plants are an enduring phenomenon in provincial urban and rented houses of Mexico.

13. At Tairona's Buritaca 200 site in the Colombian Sierra Nevada, an elaborate landscape of retention walls, canals, and drainage systems afforded in-city cropping (Coe et al. 1986: 166–167; Burland 1976: 162). In the Peruvian Andes, central plazas of U-shaped structures might have been irrigated or flooded and crops possibly grown; large ceremonial complexes were usually adjacent to cultivated fields (guinea pig remains found earlier than 1800 BC at Culebras, halfway between Trujillo and Lima) (Coe et al., 1986: 197). At Cuzco and Machu Picchu, extensive retention walls, terrace gravel beds and stone-lined drainage afforded intensive farming of steep slopes. In our times, the Yoruba of western Nigeria maintained sizeable cities that were largely self-sustaining because ("most of the productive inhabitants were full-time farmers" (Adams, 1994: 15).
14. This brief archaeological survey suggests that food production in the more advanced urban settlements of ancient civilisations, was no rare, temporary activity sited haphazardly in the urban fabric. It was not socially demeaning or technically primitive in times it was practised. Quite contrarily:
 - (a) Being more vulnerable to supply disruption or insufficiency, malnutrition or famine, food provision throughout history has been a pervading concern of cities. Under the Islamic empire the Abbasids even turned a postal service into an intelligence system, through which postmasters kept the capital city informed on food prices in their postal districts, so that supplies could be sent wherever shortages threatened. Cities have always had to ensure that a reasonable share of their food needs be supplied from within a controllable hinterland.
 - (b) Also, throughout most of mankind's history and in different civilisations, urban populations have engaged to variable extents in producing at least some of the food they require, close to if not at their very place of residence, within or

fringing the city. Reliable, minimal amounts of diverse food and nonfood items were needed to ensure subsistence and trade by what were then unprecedentedly large human agglomerations; this may explain the frequent coupling of elaborate earth- and waterworks with food production in ancient cities.

- (c) Archaeological remains and artistic depictions highlight the living conditions of ancient urban elites more than any other human group. Clearly, food production was not only carried out by better-off individuals; those in authority also commissioned, built and managed massive food-producing systems, even making room for food production when designing lower-class living quarters.
- (d) Urban food production took a variety of forms, making ingenious use of space, site conditions, closeness to equipments, facilities and markets, local light, water, soil and waste resources. The scarcer these factors, the more valuable seemed to have been the products chosen to be grown or raised by city dwellers. Many cities probably did offer the incentives, conditions, market and testing grounds for more intensive and productive farming systems to be experimented, perfected, and disseminated. Technological breakthroughs included sun reflectors; water collection, storage, and distribution; frost protection; wetland drainage and slope terracing, multicropped and layered *chinampa*-style raised beds. In his opening review of recent archaeological findings on ancient cities, Adams concludes (1994: 15) that large-scale canal networks clearly seem to have followed the advent of fully established cities.

Post-Industrial Revolution City Farming

- 15. It follows that the divorce of agriculture from cities, of food production from urban economies, is very recent in the urban history of humanity. It also has been far from universal and is showing signs of weakening both in the North and the South.
- 16. The reasons for which UA would be disregarded by governments and planners of western urban economies still need to be clarified. Lee-Smith and Memon (1994:70) recognise that the exclusion of agriculture as a permanent urban function in western contemporary urbanism can be explained by cultural connotations assigned to country and city dating back to the Greco-Roman period, then reinforced by recent urbanism

associated with the Industrial Revolution. However, Greco-Roman archaeological remains, current liberal practices in the Mediterranean hearthland, plus garden-city paradigms transferred from Europe to colonies or ex-colonies (greenbelt towns of US and garden-city colonial cores of Asian and African cities), point to a more complex arena of visions. Zoning would start to sanitise the core of medieval core of Dutch cities as early as in the 17th century (Wagenaar, 1992: 165-176). However, the sanitation argument of West European colonial powers against large-scale food production in many African cities was aiming wrongly. In the industrialising metropolises, pathologies and epidemics were bred more by hazardous and polluting manufacturing technologies and workers' substandard living conditions than by urban food production itself.

17. Western Europe's prevailing eighteenth century philosophical syndrome, opposing natural to artificial, nature to civilization, natural man to urban man (Marshall, 1992: 223) might and the privatisation of land ownership, with elite's privilege to grow food on private land by those who least needed to, might better explain the divorce. This separation was being formalised when cities and urban workers could have gained much from urban agriculture. Wartime rationing induced exceptions to this rule in Europe and North America, not dissimilarly to situations which post-colonial African cities have been facing more enduringly.
18. In the North and South and more so over the last twenty years, the forces of urbanisation have been challenging the economics of cities' reliance on distant rural food production; they also have been challenging the morality of depriving the urban poor from accessing unbuilt urban land for feeding themselves and others. The divorce is being challenged and being repaired, albeit under different arguments. In the South, several newly independent countries, included, particularly those where local representative governance has progressed, are challenging colonial urban bylaws they have inherited and are tolerating, when not supporting, urban food production. In the North, urban governments are rediscovering UA as a means to recover and exploit more fully the resources they consume, space and energy included. In both North and South, cities may eventually reduce imports from their hinterland, while extending the useful life of resources they still require. For many decades this now has been more than an utopia in major Asian metropolises.

The Asian Leadership: City-Farming Today as the World Will Tomorrow

19. In the late 20th century, the largest scaled advances in production and marketing systems for UA are found in and around major Asian cities. Here, policymakers and planners for many decades have been overtly promoting food and some nonfood production as a critical urban function. Chinese UA is expected to further develop because it has become very intensive and highly integrated (vegetable crops are highly structured spatially with intercropping, overplanting, advanced purchasing, and combined contracting) (Honghai, 1992: 5). The Shanghai Municipal Government has a fully integrated regional food-supply system (Yeung 1985: 12). UA is also being integrated with other sectors of the urban economy. The City of Dujiangyan, Sichuan, diverted its surplus labour force, to farming on wasteland, barren mountains, roadsides and field edges, as well as food processing, handicrafts and small restaurants (Liu Hing as per Honghai, 1992: 7).

20. In China, ancient household urban gardening has provided the seed for the development of urban yard farming and then, with the support of planning, full-scale UA as an integral function of urban spatial economies. In northern China the Siheyuan is a traditional residential compound with rooms built around a courtyard, where plants supplying starch, fruits, herbs, flowers and medicines are grown; often with small livestock of which wastes are applied to the gardens; garden wastes are fed to the livestock (Hou, 1991, as per Honghai, 1992: 2). From the Opium War in 1940 through the 1960s, Soviet style urbanisation and centralised industrialisation considered urban farming as backwardness and farming yards were eliminated (Honghai, 1992: 3). Since the end of the 1950s however, strategies promoting rural industrialisation and decentralised urbanisation have encouraged the incorporation of food production into urban economies. Honghai (1992:5) estimates that urban agriculture in China now feeds about of third of China's total population. Chinese urban municipalities are "over-sized" to allow room for a city "foodshed"; most large Chinese cities are nearly self-sufficient in the more perishable food crops. City and town farming has been using slightly more than one third of the State's budget for agriculture (Honghai, 1992:7).

21. Extensive biological recycling, vertical planting and mixed farming make full use of solar energy and organic wastes and are enabling UA to further develop in Chinese cities, according to Honghai (1992). These systems include three-stage recycling

(organic waste for animal forage, livestock dung for methane generation and methane tank residues for crop manure) and multiple-stage recycling (crop-livestock-biogas tank-mushroom/earthworm), plus full ecological recycling (fibrous organic waste to cultivate edible bacterium, conversion of coarse cellulose into rich forage, animal dung into tank to generate methane, tank residues feed earthworms, in turn fed to poultry, or are applied as crop fertiliser). An effective ecological cycle of mulberry-silk worm-pond fish-pig system has been perfected in South China (Yeung 1985: 14). In Guangzhou up to nine crops are grown yearly on any single field; in nearby Hong Kong, six crops of cabbage a year are not uncommon (Yeung 1985: 9).

22. An environmental monitoring network is being set up and perfected for UA in China (Honghai, 1992: 11-14, 19). In Shanghai, more and more backyards, roofs, balconies, walls and vacant space near houses are used by orange trees, vegetables, leguminous plants, grapevine, gourds and melons (Deng, 1986, as per Honghai, 1992: 8); a growing number of households are recycling organic wastes using earthworms, edible mushrooms, flies, methane-generating bacteria; underground air-raid shelters and cellars for long have been used to grow mushrooms (Deng, 1986 and Shi and Cun, 1990, as per Honghai, 1992: 8). Pig farms, as one in Beijing (Honghai, 1992: 9), produce methane out of pig waste to heat and cook, methane-based organic fertilizer and pig forage; earthworms grown on methane forage are fed back to chickens, of which droppings are reprocessed into pig forage. Major companies are actively involved in UA, such as Beijing's Capital and Steel Corporation, which planted 3.4 million trees over the last 12 years, 904 000 square meters in grass, 8.6 million flowers; factory inner-walls are covered with climbing plants over 46 500 m² (Honghai, 1992: 9-10).
23. Urban forestry is very much part of Chinese approach to UA in confined space. A study of 439 Chinese cities in 1991 put their overall green space at 380 000 ha or 20.1% of their urban area on average. Beijing has 9.2 million people on 750 km², so there is little space to waste; yet the area of Beijing under tree cover grew from 3.2% in 1949 to 28% in 1991. More than 90 different tree species were identified in metro Beijing in 1990, including 40 varieties of fruit trees that represent 17% of all trees grown in sampled areas, as much as 23% in older residential areas (Ming and Profous, 1993: 13-18).
24. Other Asian countries have intervened in different ways. Japanese census offices closely monitor the performance of city farming. Hong Kong's policy for UA is a high

degree of self-sufficiency, no subsidies, development of large-scale, modern, and fully commercial farming business. Competing urban land development is pressing cropland to shrink, but animal husbandry thrives and crop yields continue to rise, thanks to multicropping, hydroponics, and short-season varieties (Yeung 1985: 9, 12, 23). In metro Manila, a presidential decree obliged owners, or entitled others with owners' permission, to cultivate unused private lands and some public lands adjoining streets or highways (Bulatao-Jaime et al. 1981, cited by Yeung 1985: 25); community gardens have been established one of which supplied 800 squatter families with 80 percent of their vegetables from an area of only 1500 m² (Wayburn, 1985:6, as per Rogerson, 1993: 36). To increase food and fuel production, the Lae City Council assigned thousands of allotment gardens on city lands to low-income residents, assisted by city horticultural staff and with tenure guaranteed by council-granted leases and use permits (Yeung 1985: 14–15).

Expansion of Urban Agriculture Outside Asia

25. In the late 1970s UA has been growing in many developing countries, in terms of numbers of practitioners, space used, contribution to household welfare and urban economies in general. A plethora of factors come into play: rapid urbanization, 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. Artificial (civil strife and war) and natural (droughts, earthquakes, floods, and tsunamis) disasters also disrupt rural food production and supply lines to cities. One of the regions of the world for which the best data are available is Subsaharan Africa.
26. Conditions sufficient to dampen, not to say reverse, growth of UA appear increasingly unlikely to arise in most of Africa and its Subsaharan states in particular. Research and policy sectors are re-visiting UA because these factors, still dismissed as exceptional or temporary until recently, are now increasingly being recognised as multiplying and becoming persistent. Their compounding effect on urban populations is turning so pervasive that a return to "normality" is gradually becoming an increasingly unlikely, if not vanishing, prospect in many parts of the world.

27. The growth of UA in Subsaharan Africa will be discussed with evidence from specific cities in the subsequent sections. In this section the cases of Nairobi in Kenya and Dar es Salaam in Tanzania illustrate well that UA is expanding in urban economies of the region, regardless of differences countries may show in the development of their respective urban economies.

Nairobi - Kenya

28. Recent studies indicate the growth of the urban informal sector (UIS), but also the growing contribution of farming to both informal and formal urban employment in Africa. ILO statistics for 17 African countries show that in 1989 the majority of the urban labour force was being employed by the urban informal sector. During the 1980-5 period the UIS grew much faster than the formal sector, employing twice as many people and created 12 times as many new jobs than the formal sector. Formal market contractions during the 1985-7 period probably have further increased, since then, the lead of the IUS (House et al., 1993).
29. In urban Kenya in particular, 1986 data from the Central Bureau of Statistics reveal that 17.5 of self-employed and unpaid family workers and 3.5 percent of paid employees worked in agriculture and forestry (House et al., 1993: 1207). Both the numbers of self-employed and unpaid workers and their dependence on farming are probably larger than recorded by the Bureau. A rural/urban breakdown of data is not provided, but it can be assumed that most workers cannot afford to farm at great distances from their city residence. Agriculture and forestry are the second largest of eight categories (after sales workers), among self-employed and unpaid family workers. Agriculture was also the second largest of nine sectors listed, among self-employed and paid employees, absorbing 24.4 percent of Nairobi's and 33.6 percent of urban Kenya's formal sector jobs (based on Ritter and Robicheau's 1988 samples of 216 and 1100 cases respectively, cited by House et al., 1993: 1208). Furthermore, agriculture provided the highest self-employed earnings in small-scale enterprises in Nairobi and the third highest earnings in all of urban Kenya (House et all, 1993: 1209).
30. Binns (1994: 115, 122-123) notes that, while tropical Africa only had three cities with more than half a million people, twenty years later there were no fewer than 28 cities of that size, including no fewer than 7 millionaire cities. He notes that periurban areas

are often zones of intensive market-oriented food production and stresses that urban and rural development should not be treated on isolation one from the other. Reports available from capital cities of western and eastern Africa concur in stating that UA is here to stay.

Dar es Salaam - Tanzania

31. Economist Francis Lungu in Dar es Salaam (personal communication, 27 August 1993) thinks that, should structural adjustment policies ever succeed, UA would not necessarily subside; on the contrary, an increase in UA is very possible because of persisting unemployment, retrenched civil service, newcomers added yearly to the labour pool, sheer population growth, women at home resorting to UA, and a growing urban demand for abundant, regular and cheap supplies of good-quality food. The large and fast-growing city of Dar es Salaam in one of the continent's poorest countries illustrates Lungu's opinion. Like in most African countries, the Tanzanian gross domestic product (GDP) declined in real terms throughout the 1980s, from an average annual growth rate of 5.1% to less than 2.0%. This fall is attributed to falling export commodity prices, the collapse of the East African Community, war in Uganda, and successive droughts. Despite various survival, adjustment, recovery, and social action programs in the early 1980s, the per-capita income averaged 260 USD/year during the 1980s (DSM/ARDHI 1992: 4). The Arusha Declaration's emphasis on rural development did not slow the growth of Dar es Salaam: its population nearly doubled in 10 years to 1.4 million in 1988. Some 70% of its people now live in unplanned settlements and 75% of the households have to dispose of their human wastes through pit latrines; less than 3% of the city's solid wastes are collected (DSM/ARDHI 1992: 5-6).
32. Satellite imagery reveals that as much as 23% of the city region is used for agricultural production, with nearly 34 000 ha under crops in 1988 (more than 500 ha in vegetable crops) (DSM/ARDHI 1992: 8). Data on other Tanzanian cities show a similar, if not larger, incidence of UA (Moshia 1991; Mvena et al. 1991). According to the 1988 census, UA ranked as Dar es Salaam's second largest employer, after small traders and labourers; it occupied 11% of the population aged 10 or more, but 20% of those employed, turning out about 100 000 t of food crops annually. People in Dar es Salaam are engaged on a large scale in what many other large African cities are increasingly documenting, if not trying to manage more fully.

Local Authorities' Changing Attitudes Towards City Farming

33. This no doubt is turning to be a crucial vector in bringing about more sustainable urban policies in the North and the South. Worldwide, most UA still remains largely unrecognised, unassisted, or discriminated against, when not outlawed or harassed, even in years of food shortage. However, more governments are creating agencies to manage UA and many more are actively encouraging the activity. Between 1975 and 1985, governments in at least 22 countries (10 in Asia, 6 in Africa, and 6 in Latin America) were supporting UA initiatives related to the provision of land and other production inputs, technical assistance, home food production and distribution, tree crops and small-animal husbandry, food-import alternatives, nutrition, and food distribution, storage, and preservation (Wade 1987: 38–41).

North America

34. Beyond standard backyard gardening, a growing number of North American and European city governments are encouraging community gardening on city and institutional land. The number of community gardens for nine major North American cities totals 2475, ranging from 1000 in New York City down to 30 in Seattle and metro Toronto (Archibald, 1993: 33). The governments of these cities, plus Montreal, Boston, Chicago, Cleveland and Pittsburg, now provide some start-up funding and accept gardens in parks.
35. In Canada, the City of Toronto's Department of Parks and Recreation currently provides a total of 358 allotment gardens at three locations, including utility lands; metro Toronto has 14 community allotment gardens with 2000 available allotment plots (total metro Toronto area in allotment gardens: 6.2 ha Eguillor, 1993, as per Cosgrove, 1994a: 6). Two CityHome projects of the Housing Department already have gardens with composters, raised beds and soil supplied by Cityhome to tenant growers. The Department of Public Health nutritionists support urban food production and community gardening. They also monitor city school-gardening and composting.
36. In response to demands by community groups the Toronto Food Policy Council and the Healthy City Project helped to establish an Interdepartmental Working Group on Urban Food Production composed of the Departments of Housing, Planning and Development, City Property, Buildings and Inspection Public health, Parks and

Recreation and Public Works and the Environment. This group assessed capacities and expertise of various city government units and issued recommendations for these to support in a more comprehensive way the production of food in the city. These recommendations, contained in the Garden City report, were passed by City Council in December 1993 (Cosgrove, 1994a: 4). Social housing agencies sponsored community-garden projects in the mid 1980s (Cosgrove, 1994a: 3). A community coalition Grow T.O. recently obtained permission to plan a new garden in City parkland (Cosgrove, 1994a: 3).

37. Cosgrove (1994b: 2) considers Montreal's community garden program " by far the largest, best organised program in Canada". When Italian and Portuguese immigrants initiated illegal gardening in North Montreal in the early 1970s, the city attempted to regulate and organise community gardening. The movement, sheltered and championed by The Montreal Botanical Garden, blossomed beyond control. A review in 1985 clarified the policy and the Department of Recreation and Community Development now responds for the program, coordinating other departments' involvement as well: Habitation & Urban Development, Provisioning & Buildings, Public Works, and Planning and Policy. Gardens are very productive and have long waiting lists; the city provides insurance and horticultural animators; organic methods are mandatory, gardeners must grow at least five different types of vegetables, relocates gardens; some of the food produced is donated to community kitchens. The City of Montreal has 75 community garden sites, totalling 6654 plots (plus 30 other sites elsewhere in metro Montreal, Archibald, 1993: 33).
38. Contrarily to Toronto, in Montreal urban food production is an official and permitted land use, with about one third of "community garden" sites zoned as such, including 13 of their 22 sites on city parkland (Archibald, 1993: 11).

Latin America

39. A 1994 IDRC survey of institutional capacities and ongoing UA activities revealed growing official support in the region. Fifty-five senior officials of 41 institutions (U.N. and regional agencies, public and private research centres, national government departments and local development NGOs and consultant firms) were interviewed in Dominican Republic, Mexico, Costa Rica, Colombia, Ecuador, Peru, Bolivia, Chile and Argentina (Prudencio, 1994).

40. In Costa Rica, the Food and Nutrition Division of the Ministry of Education supports 1500 gardens countrywide, which supply food to school cafeterias feeding half a million students; it is looking for ways to produce under growing space constraints. Nutrition Department officials believe urban food production must be encouraged beyond food donation to child care centres. In Argentina, the Instituto Nacional de Tecnologia Agropecuaria, with Ministry of Health funding at least until 1997, cooperates with over 800 institutions to support nearly 56 000 gardens in 1300 localities (61 percent urban and semiurban); these reportedly benefit directly 430 000 people.

41. In Lima, a central hospital houses training and crop-testing facilities of Peru Mujer, a women-run NGO supporting some 252 produce gardens (household, communal and school-based) in three low-income districts of Lima. The municipality of the San Juan de Miraflores district, in agreement with the Panamerican Centre of Sanitary Engineering and Environmental Sciences, operates a wastewater treatment plant coupled to fish tanks yielding 4 t/y of algae-fed Nile tilapia, in great demand on Lima markets; the plant also irrigates 60 has of fieldcrops and 290 has of forestland (Prudencio, 1994). In Brazil, more backyards, vacant plots, road and streamsides are being converted to food production in low-income districts, as observed by Yves Cabannes (personal comm. Aug 1994) in Fortaleza, Agnès Serre (person. comm. Sep 1994) in Belém, and Martin Coy (1994: 10) in Cuiaba. The Municipality of Cuiaba, which owns 143 green areas, is elaborating a municipal environmental plan to be coupled to the city's master plan.

Africa

42. While gardening and some animal husbandry has been permitted on private plots since colonial times, official initiatives have been minimal for incorporating UA to low-income housing plans, the management of institutional and open public space, as well as citywide zoning. What Lee-Smith and Memon (1994: 71) say of Kenya may well apply to many other East and Southern African former colonies: Kenyan urban centres were gazetted as townships under the Townships Ordinance of 1903, to function as centres of colonial authority and rule, over which strict sanitary control could be maintained. Boundaries were carefully defined to avoid existing areas of subsistence farming and settlement, while upper-income residential districts were laid out according to the garden-city model, often protected from less salubrious land-uses by

buffer zones of public open space. Permanent settlement of indigenous Africans was proscribed and carefully policed.

43. However, like post-Russian nationalist China, a growing number of newly independent African countries are departing from colonial approaches to urban planning. New national capitals of Côte d'Ivoire, Malawi, and Tanzania have been planned to accommodate and their authorities are encouraging UA (DGIP/UNDP 1992: 2, 25). As for major existing urban centres, local governments have commissioned special sectoral studies on urban agriculture in capital cities as part of master planning processes, as in Maseru, Lesotho (Greenhow, 1994: 2); Kampala, Uganda (NEIC, 1994) and Dar es Salaam (DSM/ARDHI, 1992). In contrast with its 1967 version, Kinshasa's 1975 master plan set aside areas for horticulture in the east, central, and south-west sections of this multimillion-people city (Pain 1985: 34).
44. Some intermediate-city authorities have also innovated. Tanzanian municipalities have experimented with zones for UA in recent years. While breaches to regulatory constraints on public land have led to harassment in Nairobi and Kisumu, councils in other cities have been innovative and pro-active, either supporting crop irrigation, as in Isiolo, providing crop extension, as in Kitui, or experimenting with allotments for food crops, as in Kitale (Lee-Smith and Memon, 1994: 83). In Nigeria and Zaire — as in China, Japan, Papua New Guinea, and the Philippines —, urban farmers have been protected and encouraged through land-use regulations and tax concessions (Diallo 1993; Lado 1990: 257).
45. In Daola, Côte d'Ivoire (population 123 000 in 1988), peri- and intraurban agriculture grew tremendously between 1954 and 1988, promoted successively by Chinese immigrants, native ethnic minorities, and local authorities: one official project had 456 rice growers on government-improved and acquired bottomland in 1988. A 1989 map shows 55 poultry farms located within and fringing the built-up area, with 13 pig farms and 110 fish ponds in the city's immediate vicinity. Della (1991) also surveyed Daola's intraurban agriculture: some 121 part- and full-time producers tended 250 ha of well- and tank-irrigated rice paddies and native and introduced vegetable crops on marshland within the built-up area; these plots supply various governmental and public agencies. On the urban fringe, agriculture has adjusted to rapid city growth, with labour-demanding lowland cropping expanding from 52 to 624 ha between 1954 and 1983.

46. In some major cities the changes in official attitudes have been remarkable. In Harare, Zimbabwe, bylaw enforcement has been among the more stringent observed in east Africa. However, official attitudes towards UA have progressed considerably over the last decade, as reviewed carefully by Mbiba (1994: 194-200). Authorities originally were opposed to any off-plot UA, as reflected in information campaigns to enforce stream protection from felling and cropping at all cost, tree-planting programs and the demarcation and pegging of cultivable areas, plus the policing of UA by a municipal security unit in high-density areas. A Greater Harare Illegal Cultivation Committee was later set up by the City Council, of which aggressiveness began to worry ministerial authorities. Pressed by the Ministry of Local Government and Town Planning, the Harare City Council in the early 1980s finally issued a more accommodating policy: UA could now take place on Council land leased from the Council by coop producers. However, slashing of crops on other public land proceeded, until major confrontations prompted a review, followed by the suspension, of crop slashings in 1992 and ever since.
47. A local stakeholders' workshop in Harare in early 1994 (ENDA-ZB, 1994b) further identified critical issues which need to be better documented in order to guide a better management of UA in Harare. In cooperation with the Ministry of Local Government and the Department of Housing and Community Services, ENDA-Zimbabwe concluded a baseline survey of open-space UA in Greater Harare; it now plans to research more specific UA management issues. In 1989 in Harare, 246 out of 298 cooperatives managed by the City Council's Department of Housing and Community Services (DHCS) in 1989 were agricultural cooperatives, 16 in food-catering, distributed in six major areas, among which was the peri-downtown sector of Highfield-Glenview-Waterfalls. A number of chicken cooperatives were active. The DHCS also managed some 97 women's clubs with about 2 700 members and four youth groups were classified under agriculture. With its activities in housing, home industries, youth and women's clubs, child development, health and nutrition, transportation, markets, and recreation, the DHCS of Harare City Council could promote UA in a highly integrated fashion, with multiple benefits to a wide range of population groups and economic sectors.
48. Thus, in several East African countries ministries of local governmental affairs and agriculture, municipal health and nutrition agencies, associations of urban municipalities, and elected urban-district councillors have become more tolerant, if not supportive, of city farming recently.

City Farming on Global Agendas of Local Authorities

49. Not surprisingly, international congresses of city governments are now paying much greater attention to the role of UA in urban development than reported until recently. For instance, the International Union of Local Authorities had panels addressing city farming at their 31st World Congress in Toronto in June 1993. In June 1994 the Global Forum 94 in Manchester convened 50 city delegations from the North and the South; it conducted an Advisory Workshop on Urban Agriculture where delegates representing 25 of the 50 cities invited acknowledged UA and qualified its impact positive. Almost all questionnaire respondents at the Workshop said there is UA both within and at the edge of their home city; a little more than two thirds said it is done by households, with a third adding that entrepreneurs and institutions are also engaged in UA; only a quarter said UA causes some problems but two thirds said their city benefits from it. A third said UA was regulated in some way in their city, with only about a quarter knowing of any support programs or research underway in their city on UA. In August 1994, in a Declaration on Social Development and Sustainable Human Settlements, issued at the International Colloquium of Mayors on Social Development at the U.N. in New York, over 100 mayors from around the world invited the various sectors of society to join them in six categories of actions for the sustainable social development of their cities. The top-of-the-list one reads:

"Reducing urban poverty by providing productive employment for the poor and the jobless in the private and public sectors, promoting urban agriculture and supporting micro-enterprise development through credit and training, particularly the informal sector;" (ICMSD, 1994: 10).

Urban Food Security is Significance of Urban Agriculture: The Bottom-Line

50. This seems to be forging the single strongest argument which politicians and planners invoke in the South to somehow accommodate the rise of farming in their cities. Food security is basically defined as "access by all people at all times to the food required for a healthy life." It addresses the risks of not having access to needed quantities and quality of food (von Braun et al. 1993: 3). One can readily see why local authorities have begun to seriously revisit earlier, largely colonial attitudes, towards city farming.

Urban Vulnerability to Food Imports

51. Urban food supplies in developing countries (LDCs) can no longer be taken for granted: by 1980, nearly 50% of all food consumed by people in the cities of the developing world was imported from other countries (Austin 1980, quoted by Wade 1987: 37). In African cities, many imported food products now cost relatively less than local food, at least during part of the year (Vennetier 1988: 221). The internationalization of urban food-supply systems, in countries stricken or not by famine, and its effects on diet changes, food prices, infant health, and local enterprises are provoking renewed concern (Drakakis-Smith 1990). In Harare, a former Secretary of Agriculture, now chairman of the Agricultural Marketing Authority, now sees UA as a national food-security issue (Charles Gore, personal communication, Harare, 1 September 1993).

Food: Basic Luxury for the Urban Poor

52. For a large and growing segment of the population, food is turning into a basic luxury. In 1990, households in nearly half (23) of the LDCs' largest metropolitan centres were spending 50–80 percent of their average income on food (PCC 1990). Among the listed cities, most hard-hit are Calcutta, Ho Chi Minh City, Istanbul, Kinshasa, Lagos, and Lima. Global figures only tell part of the story; survey estimates for low-income groups are much bleaker. In metropolitan USA, for instance, households spend 9–15 percent of their income on food, but the poorest 20 percent of Americans spend 34 percent of their after-tax income on food (Ethelston, 1992: 16).
53. In India, 80% of urban families typically spend 70 percent of their income on food; master plans of Indian cities rarely, if ever, provide land for food production (Newland 1980, cited by Yeung 1985: 2, 5). In Bangkok, the lowest-income families spend 60% of their income on food (Sukharomana 1988: 7). In Ecuador, 74 percent of urban households had insufficient incomes to afford basic food purchases: percentages vary from 62 percent in Babahoyo to 84 percent in Tulcán, with Quito and Guayaquil scoring 67 and 71 percent respectively (Fundación Natura, 1993, II). A small sample of urban households in Bolivia suggests that, on average, they were spending 32 percent — but the poorer households, 70–89 percent — of their income on food (León et al. 1992: 72, 73, 77). In the low-income urban district of La Florida, Chile, 64 percent of interviewed households were spending more than 50 percent of their

budget on food; even so, 42 percent could not fully cover their basic food costs and 63 percent were not managing to satisfy their basic nutritional needs (Cereceda and Cifuentes 1993: 273, 277).

54. In Africa, poor urban Kenyan households have to spend 40–50 percent on food and cooking fuel alone (Lee-Smith et al. 1987: 14). In 1983, 34 percent of 189 surveyed households in Bamako spent 32–64 percent of their average income on food and cooking (Diallo and Coulibaly 1988: 20). In Egypt, food represents 60% of family budgets for more than 50% of all urban households, despite state control of food supply and distribution channels, and state subsidies on basic items (Khourri-Dagher 1987: 37). For low-income households in Dar es Salaam, the percentage of income spent on food rocketed from 50% in 1940 to 85% in 1980 (Sawio 1993: 55). In Kinshasa, in 1982, food purchases were already absorbing an average 60% of total household spending (Pain 1985: 44); a 1988 study of food consumption showed that in major Zairian cities 67.4 percent of monthly household expenditure went to food purchases (MacGaffey, 1991: 14). In the early 1980s, a minimum wage fed a Ghanaian family for a week with a staple starch. An official in Conakry could only feed his family for three days with his monthly wage. Senior Ugandan civil servants could only buy 1.5 bunches of banana with theirs. An Angolan official would pay six days of his salary for one chicken. And an average Tanzanian household of six could be fed on formal wages for six days of the month at most (MacGaffey, 1991: 15-16). Apolo Nsibambi, was writing in 1988 (151): "In Uganda, where the salary of an ordinary wage-earner lasts for two weeks, food alone wipes out the entire salary".
55. Dar es Salaam illustrates how badly urban wage purchasing power can trail food price increases. In this city, a daily minimum wage could buy 10 kg of maize or 4.8 kg of rice in 1973, but only 1.3 kg of maize and 0.8 kg of rice in 1985 (Bagachwa 1990: 26, cited by Sawio 1993: 10). Food-price surveys of five developing countries showed that city dwellers paid between 10–30% more for their food than rural dwellers (Yeung 1985: 2).
- 55a. Food insecurity grows with the share of its budget which a household must spend on food. The fewer the household's alternatives to buying food, the more it will be food-insecure. If one is a city poor, one's coping strategies are fewer than in rural areas. In the Ecuadorian city of Cuenca, 56.5% of interviewed street scavengers precede the collector-truck runs by 5 or 10 minutes and sort out of residential, office, and public

garbage, meal leftovers and overripe or rotting fruits and vegetables, to feed their family (Fundación Natura 1993, II).

56. In African cities, to eat a single daily meal is becoming commonplace, and this undoubtedly affects people's nutritional health (Vennetier 1988: 222). Even when doing so, if one is poor, one will tend to pay relatively more than do higher income consumers for the food one buys. More likely than not, one will be forced into inefficient shopping practices: smaller, more frequent purchases from various and distant sources, more cash spent on transportation, more losses from bad storage, and so forth. Vennetier (1988: 222) considers the microretailing of food as a strong price-hiking factor in African cities, the higher prices being charged to those who are less able to pay.
57. Per-capita energy consumption is generally higher in rural than in urban areas, regardless of income or expenditures. However, poor urban manual workers may have higher energy needs than the average urban resident. Calorie costs are higher in metropolitan than in smaller centres, and, in poor regions, intraurban differences can be greater than rural-urban differences (von Braun et al. 1993, p. 14). Micronutrient deficiencies can be much more prevalent among lower-income than among higher-income families, as shown in Manaus, Brazil (Amorozo and Shrimpton 1984, cited by von Braun et al. 1993: 18).
58. Available findings are collapsing the myth of urban privilege over rural neglect. In some countries, as much malnutrition prevails in large cities as in rural areas; malnutrition is often likely to be higher in urban slums than in a typical rural area. Although some doubted that there were marked rural-urban differences in malnutrition levels in Africa during the 1970s, the experience of the 1980s now has clearly dispelled such doubts in many countries. Schilter (1991: 11) and staff of the United Nations Children's Fund (UNICEF) (Francis Kamondo, personal communication, 24 August 1993; Bjorn Ljungqvist, personal communication, 25 August 1993) believe that malnutrition in Nairobi, Lomé, and Kampala is now more acute than in rural Kenya, Togo, and Uganda, respectively. In Cairo-Giza, the rate of malnutrition is nearly as high as in rural areas of Egypt. An eight-country survey revealed that between 25 and 30% of the urban population was malnourished and more so than rural populations in five of the eight countries studied (von Braun et al. 1993: 13, 23).

The Rise of Urban Agriculture: How Many Do It?

59. As a result, urban food production has become a complex, thriving industry. More and more people in LDC cities are trying to grow some of the food they need, even if it is not much. Globally, about 200 million urban dwellers are now urban farmers, providing food and income to about 700 million people — a minority of households farm in North American cities, whereas most do so in Siberian and smaller Asian cities (DGIP/UNDP, 1993: 3). Estimates are 25% in urban USA but 65% for Moscow in 1991 (Smit and Ratta, 1992).
60. In Peru, more than 50% of the households are reported to raise guinea pigs at home (Charbonneau, 1988: 7). In the El Alto area of La Paz, Bolivia, based on a sample of 266 households representing a range of incomes, from August 1984 to June 1985, between 31 and 55%, depending on the district, raised small livestock for self-consumption (hens, rabbits, pigs, lambs, and ducks), with the number of self-consumers tending to increase. Animal husbandry is the main source of animal protein for households, with the low-income group representing as much as 68.1% of all raisers during the period. Also, between 14 and 68.4% of households grew food crops, mostly tubers, but also produce and vegetables, with the majority again being low-income growers (Prudencio, 1993: 226–229).

African City Farming: Employing Underused Human and Land Resources

61. In Africa, cities for which surveys are available over time show a growth in the proportion of households practising some form of UA; few cities for which data are available report a growth in the area under UA as well. In Lusaka, a survey of 250 low-income nontenant households in five compounds of urban Lusaka in mid-1980 found that 45% of them cultivated food within or on the fringe of the city (Sanyal, 1984: 198). Rakodi (1988) 's subsequent study showed percentages varying between 25 and 56 percent, reaching 73-80 percent in some areas (Lee-Smith and Memon, 1994: 74). A 1991 dry-season survey on vegetable supply only of urban townships of Lusaka found that nearly 50 percent of respondents practised vegetable gardening. An FAO-funded household garden survey in 1992-3 found that 42.6 percent of 648 interviewees within Lusaka Town practised gardening (Drescher, 1994:7). While rainy season urban plots covered an average 300 m² in the late 1970s (Jaeger and Hickabay, 1980, as per Drescher, 1994: 8), the FAO 1992-3 survey showed that this

average area had grown to 423 m², ranging from 231 and 666 m² in six different sectors of Lusaka (Drescher, 1994: 8). In Harare, an air-photo interpretation of open-space cultivation by ENDA-Zimbabwe (1994) reveals that this has grown by 92.6 percent in almost four years, from 4288 has in 1990 to 9288 has. in mid 1994. While only 8.8 percent of Greater Harare area was under off-plot cultivation in 1990, this had doubled to 16.7 percent by mid 1994 (ENDA-ZB, 1994: 12).

62. In Maseru Lesotho (110 000 in 1986), an official survey of 4280 plots showed that 55 percent had some form of UA ongoing; in low-income areas, horticulture abounded where soils permitted, with small livestock being preferred on more rocky soils; dairy and poultry husbandry was fairly common in upper income districts (Greenhow, 1994: 2).
63. In Addis Ababa a 1983 survey indicated that 17 percent of 1352 households surveyed produced their own vegetables (Hormann and Shawel, 1985, as per Egziabher, 1994: 88). Data for Dar es Salaam show that, in 1980, 44% of low-income earners had farms, but in 1987 some 70% of heads of household engaged in some farming or husbandry (Malilyamkono and Bagachwa 1990: 126, cited by Sawio, 1993: 63–64); another study found that nearly 50% of workers and 59% of all residents of 287 households in Dar es Salaam reported having farms in 1987/8 (Tripp, 1989).
64. A three-staged sample of 1 576 urban households (57% in low-income groups) in six Kenyan cities found that 29% grew part of their food and 17% raised livestock in the urban area where they lived in 1984/5 (Lee-Smith et al., 1987). According to one senior local UNICEF officer, clearly more of the food sold by street-food vendors in Nairobi (spinach in particular) now comes from urban home gardens than was the case years ago (Francis Kamondo, personal communication, 24 August 1993).
65. In the early 1980s UNICEF/KCC estimated that a quarter of low-income households farmed and Save the Children Fund (SCF), but in the early 1990s the Makerere Institute of Social Research study found that 36% of the households surveyed within a 5-km radius from downtown, and 30 percent of all households citywide, were engaged in some form of agriculture (Maxwell and Zziwa, 1992; Maxwell, 1994: 49). In Kisangani, 33% of 426 households responded that they practice UA (Streiffeler 1991: 268, cited by Sawio 1993: 103).

66. Also, in many of the studies quoted here, large percentages of nonfarming households surveyed said they would farm if they only had access to land to do so. In 1992-3 nearly 40 percent of the members of the survey in Lusaka Town resorted to gathering of wild fruits and vegetables to supplement their food intake or income; percentage reached 80 percent in peri-urban and rural areas outside Lusaka Town (Drescher, 1994: 4).

Urban Agriculture Shouldering Cities' Food Self-Reliance

67. Clearly, UA already is contributing considerably to the food self-reliance of many major cities. Food self-reliance is not self-sufficiency but it can go a long way toward reducing the food insecurity of vulnerable groups of people. No one expects that UA will supply largely the urban demand for cereals and tubers; these products can be stored and transported more easily from rural production areas with limited losses. However, what is striking and must be recognised is that UA, with little support, already supplements a significant share of cities' food needs and of quality-foods they depend upon. In the USA, the Department of Agriculture statistics show that one third of the country's agricultural output comes from urban/metro areas (Ratta and Smit, 1993: 26; Smit and Nasr, 1992: 142).
68. In Asia, Singapore is relatively self-sufficient in pork, poultry, and eggs, and grows 25 percent of all vegetables it consumes (Yeung, 1985: 22). On 10 percent of its area, Hong Kong in the early 1980s was producing 15 percent of pork, 45 percent of the fresh vegetables, and 68 percent of live chickens it consumed (Wade, 1981, cited by Yeung, 1985: 19). Shanghai's *neichiao* (inner zone) provides 76 percent of the vegetables consumed in the city, with only 16 percent of the cultivated land devoted to this crop (Yeung, 1985: 12). Within their municipal bounds, six large Chinese cities grew 85 percent of their vegetables requirements (Skinner, 1981: 215–280, cited by Yeung 1985: 8–9), with relatively small waste and wastewater problems and budgets (Smit and Nasr 1992). Karachi produced 50 percent of its fresh vegetables (Smit, 1980, cited by Yeung, 1985: 9). Metro Calcutta's 4 500 ha of fish-stocked wetlands produced 10 percent or more of its daily fish consumption (Panjwani 1985: 35). In Kathmandu, 30 percent of the fruit and vegetable needs are met by household production alone (Wade, 1987: 4). Some Latin American metropolises grow 30 percent of the vegetables they consume (Heimlich, 1989, cited by Sawio, 1993: 116).

69. In Africa, a single cooperative in Addis Ababa in 1983 supplied 6 percent of cabbage, 14 percent of beetroots, 17 percent of carrots, and 63 percent of the swiss chard consumed in the city (Egziabher, 1994: 98). In Kampala about 20 percent of the staple foods consumed within the 5-km radius of the city centre were produced within that same area, the percentage being probably higher in the other less built-up municipal area. Official statistics indicate that Kampala produces 70 percent of all poultry products it consumes (Maxwell, 1994: 49). Some cities even manage to export to other centres — eggs and chickens and orchids from Singapore, grains and vegetables from Shanghai (Yeung, 1985: 14, 22) chicken broilers from Bangkok to Tokyo, and fresh fruits from Abidjan to Paris (DGIP/UNDP 1992: 4).
70. International development policies nurturing rural–urban dichotomies have been starving cities. Beyond industrialisation programs which, in the 1960s, disregarded the rural areas on one hand, and the agricultural programs of the 1970s and 1980s, which ignored the burgeoning urbanisation, more balanced development approaches are now needed. Urban agriculture now gives us good reasons for better exploiting rural–urban linkages; fittingly, a recent series on the urban–rural interface in Africa dedicated a full section to UA (Baker and Pedersen, 1992). The comparative advantages which rural and urban areas hold must be exploited to meet large cities’ growing needs for affordable and reliable supplies of sufficient and nutritious food. In the process, a number of related economic, social, gender, environmental and political issues can be addressed more integrately.

A Record of City Farming Benefits to Urban Households

71. There are more signs that UA contributes to producers’ well-being. It enables them to satisfy part of their needs in food. It provides them with ready access to nutritious food which positively affects their health status. It enables them to save cash and earn income which then can be spent on other necessities.

UA’s Contribution to Food Intake

72. In the poorer countries and among the lower-income groups, self-produced food can cover a considerable share of a household’s total food intake and can save or release an even larger share of the household’s cash income to cover nonfood expenses. Self-produced food accounted for as much as 18 percent of total household consumption

in East Jakarta (Yeung, 1985). However, percentages are much higher in surveyed African cities, as urban farmers produce mostly or largely for household consumption: 77 percent in urban Kenya (Lee-Smith and Memon, 1994). In Nairobi, over 50 percent used the entire amount harvested to feed their families or dependents — about 25 percent share or pay helpers with food (Lado, 1990: 264). In Pointe Noire, 26 percent of households or 33 percent of the population self-supplied all or part of its needs for cassava (Vennetier, 1961: 71–72). In Dar es Salaam, nearly 50 percent of 260 intraurban producers reported that UA contributed 20–30 percent or more of the household's food supply (Sawio, 1993: 309). In Kampala, 55 percent of 150 producers obtained 40 percent or more, and 32 percent obtained 60 percent or more, of their household food from their own urban garden (Maxwell and Zziwa, 1992: 49–50). The poorest households in Lusaka were estimated to self-produce about one third of all the food they consumed (Sanyal, 1986, as per Rogerson, 1993: 38). In Kenya 40 percent of the 1576 urban farmers interviewed in the six Kenyan cities said they would starve if stopped from farming (Lee-Smith and Memon, 1994: 80). In Kampala, almost without exception, those engaged in UA said that even if they were offered jobs whose cash remuneration was equivalent, they would not stop farming (Maxwell, 1994).

Nutritional Impact

73. The impact of UA on households' nutritional status is still under-researched but the few data available are encouraging and more are being collected. Still, much already has been, which could be retrieved from existing sources. According to a 1981 UNICEF survey of households with children aged 5 or under in 13 low-income districts of Kampala, partial reliance on intraurban food production largely explained why supplementary feeding aid could be discontinued. This had taken place despite dramatic economic decline during the late Amin regime and a war with Tanzania: 24 percent of households were engaged in within-city farming. The Save the Children Fund (SCF) 1987 survey in one division of Kampala came to a similar conclusion (Maxwell, 1993a).
74. The findings of SCF largely coincide with initial results of a 1993 survey by a team of the Makerere Institute of Social Research, which impressed the Kampala City Council's Public Health Office. This study found a highly significant difference between farming and nonfarming households in the low- and very low-income groups, with respect to stunting among children under 5 years of age. Areas surveyed coincide with some

covered by the World Bank-funded First Urban Project in Kampala. Differences between these nonfarming and farming groups have also been observed, although they were not statistically significant, on wasting — a shorter-term effect of malnutrition (Maxwell, 1993a).

75. Such results suggest that the poorer a household is, the more their mothers may be inclined to do some UA to prevent malnutrition. In Nairobi, a 1992 baseline survey commissioned by UNICEF and the Nairobi City Council's Nutrition Section in two low-income sectors found that 21.6 percent (as much as 33.1 percent in Gatina) of 250 children sampled were nutritionally stunted. It found UA was not adequately addressed and recommended that the promotion of UA and marketing of UA produce be seriously reviewed with municipal authorities, so as to make food more accessible and affordable to low-income urban mothers (Mutiso, 1993).
76. Conventional strategies for urban food security need to be reassessed in view of UA's potential role: an extensive survey of subsidy programs found that income transfers from food subsidies tend to provide 15–25 percent of the real income of low-income households (von Braun et al., 1993). This is roughly what still largely unassisted urban farming seem to be achieving already, as documented earlier. UA does this at a much lower cost, probably with more benefits to consumers themselves, if not to the general urban economy.

Cash Savings

77. In Dar es Salaam, the lower-income group spent 77 percent of its income on purchasing food; home-cultivation supplied the equivalent of 37 percent of their income and saved them 50 percent of their expenditure in food (Sanyal, 1986: 32). In Addis Ababa, cooperative households' consumption of vegetables was 10 percent higher than the urban average and this enabled them to save 10–20 percent of their income (Egziabher, 1994). In Maseru, Lesotho, a detailed survey of 428 plots revealed that, in the late 1980s, 69, 51 and 32 percent of low, medium and high-income vegetable producers were trying to save money through growing vegetables at home; about 66 percent of the high-cost, and 29 percent of the low-cost, district households claimed to sell some of their produce regularly (Greenhow, 1994: 2).

Income Generation

78. Urban agriculture can also increase a household's cash income. In Bolivia, urban food projects supply women producers with 25 percent of their total income (Prudencio, 1993: 15). In Dar es Salaam, UA generated incomes are larger than regular salaries for 67 percent of respondents (Sawio, 1993: 312). In Addis Ababa, all urban cooperative farmers showed incomes well above those of half the city's population: 50 percent earned more than 70 percent of the city's employed population (Egziabher, 1994). In Nairobi, 47 percent of the urban farmers had no visible means of support other than their urban *shamba* plots (Lado, 1990: 263).

The Booming Business of Urban Animal Husbandry

79. Tanzania's Ministry of Agriculture and Livestock Development keeps statistics on UA and annual reports of the Livestock Office of Dar es Salaam's City Council show that both livestock numbers 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 (Moshia 1991: 84). These official data give a conservative picture of reality according to local observers. Similarly, while it was initially reported there is little livestock rearing in Harare (Mbiba, 1994: 191) the ENDA (1994: 15, 17, 22) ground survey, which targetted major high-low and medium-density sectors under off-plot cultivation, revealed that 1059 of 2700 (39 percent) interviewees in those areas (66.7 percent and 76.6 percent of whom practised on and off-plot cultivation, respectively) raised 27 776 heads of livestock, largely chickens (57 percent of growers and 84 percent of all animals), but also rabbits, pigeons, ducks, turkeys and peacocks. Nearly 90 percent of livestock producers live in high-density districts (most of dairy husbandry is carried out on large residential plots excluded from the survey).
80. Ownership of urban cattle is mostly afforded by upper-income UA practitioners. Individuals are known to raise dairy cattle on their urban residential compounds in Addis Ababa, Harare and Dar es Salaam, in addition to other livestock (Egziabher, 1994: 87; ENDA-ZB, 1994; Sawio, 1993). In Addis Ababa, the Livestock and Fishery Corporation in the Ministry of State Farms runs dairy, sheep, and poultry farms in the city (Egziabher, 1994: 87). On Harare outskirts, the City Council irrigates pastures with treated wastewaters for cattle which then it slaughters and sells to urban market outlets.

81. Milk vending can be a lucrative undertaking for urban dairy producers. In Dar es Salaam in August 1993, one cow yielding an average of 10 L of milk daily, if this were all sold at 200 TZS/L, would generate a gross income of 2 000 TZS (575 Tanzanian shillings (TZS) = 1 United States dollar (USD)). This, minus an average maintenance cost of 500 TZS daily, would leave a net income of 1 500 TZS daily or 10 500 TZS weekly, when the minimum monthly salary was set at 7 000 TZS. Anyone wishing to cash-purchase a cow has to disburse an average of 150 000 TZS (Camillus Sawio, personal communication, 29 August 1993): cows can be acquired through various means other than cash purchase. In 1988/89, there were 8 517 dairy cows officially censused in the Dar es Salaam City region. If, in August 1993, there were at least as many dairy cows producing an average 10 L/day in Dar es Salaam, these were worth the equivalent of 2.2 million USD and generated a net overall annual income equivalent to 6.75 million USD (10-month lactating period). Assuming that only half of the milk was sold, the equivalent to 3.38 million USD was still accruing to the urban cow owners annually.
82. Also, assuming that 75 percent of the estimated 23 000 heads of cattle in Nairobi in 1985 were dairy cows, the annual retail value of milk produced in the city of Nairobi was at least 13 million USD; this was probably only part of the local milk-market picture as, according to Lee-Smith and Lamba (1991:38), the city of Nairobi was also the home to an estimated 26 000 goats in 1985. Also, the cost of living in Nairobi was probably higher than in Dar es Salaam, from which milk prices are taken for this estimate.
83. Because urban dairy production is lucrative, it attracts reinvestments which make it competitive within cities. The District Veterinary Office of Kampala counted 1751 heads of cattle in the city in 1993; while the numbers of indigenous breeds have declined in recent years, the zero-grazing of exotic and cross-bred dairy cattle has been rising, actively promoted by NGOs (NEIC, 1994 draft).
84. The smaller the livestock, the more affordable it is to a wider range of sectors and the more easily it can make use of limited spaces in the urban fabric. In Kampala at least 105 private homes and three institutions were raising over 1 100 pigs altogether (87 and 13 percent of the total respectively). The central-city division boasted the second largest concentration (30 percent) of all animals reported, largely piglets sold for sale and slaughter. As in Dar es Salaam, poultry is thriving, having grown by 60 percent

up between 1991 and mid-1993, when it totalled 156 000 animals (NEIC, 1994 draft: 79-81)

85. As food crops, urban livestock can sustain sizeable markets for inputs and outputs, from feedstocks to slaughterhouses. In Kampala the growth of poultry is in turn boosting the business of hatcheries and chicken feed outlets in the city (NEIC, 1994 draft: 81). Within the city limits of Maseru, Lesotho, in the mid-1980s seven egg producers owned 75 000 birds, the marketing agency supplying the city with 90 000 dozens of eggs per month. An expanding poultry industry had over thirty large-scale poultry producers, a broiler unit and a slaughter unit with a 2 500 birds/day capacity; the national pig-breeding herd was found within the town, with capacity of producing 2500 weaners per year (Greenhow, 1994: 3). Maseru's dairy plant in the mid-1980s processed 3000 liters of milk a day from 94 urban producers, even so catering in this way only for about 40 percent of the town's estimated overall milk production (Greenhow, 1994: 3).

86. Small-scale urban farming's annual production in crops and livestock may be worth tens of millions of dollars (US). In metro Rio de Janeiro, 172 ha cultivated on lease, under electrical transmission lines, put 10 million USD of garden produce on the local market in 1983 (La Rovere 1986, p. 32). In Kenya, the Mazingira Institute's six-town survey of 1 576 households gave the following estimates for urban Kenya in 1985: 25.2 million kg of crops worth 4 million USD and 1.4 million livestock worth 17 million USD. In Nairobi upper income farmers keep heads of cattle while lower-income practitioners raise chickens, rabbits, sheep, goats. The value of animals eaten by producing households in urban Kenya was estimated at 1.5 million USD annually in 1985, with another 2.4 million USD worth lost in livestock deaths (Lee-Smith and Memon, 1994: 78). In Maseru, the annual value of UA was estimated at maloti 6.7 million maloti/South African rands (Physical Planning Division and Institute of Land Use Planning, 1987: 27, as per Mbiba, 1994: 192).

- 86a. Although research on UA seems to have focused more on food crops than on animal husbandry, the few data available reveal that livestock keeping is particularly amenable to farming in small urban spaces and where soils are less fertile or water scarce (even space-scarce Cairo in the early 1980s had at least 80 000 households home-raising animals (Reed 1984, cited by Khouri-Dagher 1987: 41)). It can combine with plant cultivation to give a highly productive farming system (Siau and Yurjevic, 1993). It is less visible and less easily surveyed, thus often more widespread and

profitable than generally reported. Some forms are less affordable to low-income farmers and most forms are subject to more controls than plant cultivation in general.

The Spatial Extent of Urban Agriculture

87. Well-tailored surveys consistently show that the area effectively under UA is very much greater than conventional land-use classifications and maps may capture.
88. Urban agriculture claimed the largest land use within the city boundaries of Waterloo, Canada, in 1981 (Dorney, 1990, cited by Sawio, 1993: 121). In Sheffield, England, nature gardens and allotments together cover 22 percent of the inner city area and City Council is encouraging the "green" redevelopment of a much larger central area, struck by industrial decline (Carr and Lane, 1993: 10). There are still 28 000 ha being cropped in three Delegations of the Federal District of Mexico; the Tlahuac Delegation supplies one third of the eggs/milk produced in the district, while Tlalpan is first in terms of areas planted with oats, fodder and fresh maize (Brena, 1993: 149). Some 60% of Greater Bangkok was officially under UA in the 1980s (DGIP/UNDP, 1993: 4). A little more than half of the municipal area of Kampala is used for agriculture (Maxwell, 1994: 48). In Bamako, 1 550 ha available for UA are fertilized solely with domestic wastes (Diallo and Coulibaly, 1988: 30). Five cooperatives produced vegetables on 274 ha in Addis Ababa (Egziabher, 1994).
89. Reported areas often exclude forms of UA in hidden household spaces (individually small but collectively considerable). There is probably more UA in any city than meets the eye of conventional air photography; much UA, away from the easily observable crops on open-land surfaces, actually thrives under tree cover, in shelters or on roofed surfaces, on wall shelves and fences, and in basements, or "grazes" other unbuilt land areas. Where surveys are carried out in the dry season, extensive rainfed crops are probably missed.

Urban Agriculture: An Adaptive and Mobile Land Use

90. Urban agriculture is a major urban land use because it is remarkably adaptive and mobile. It is found on sites of various types (constructible and undeveloped land, physically unconstructible land and voluntarily undeveloped, idle public lands and water bodies, and household spaces); Lado's (1990: 262) survey of 618 farmers in Nairobi's open spaces (unenclosed, wholly or partly on public lands) show that private

residential land use is chosen most often (32%), followed by roadside verges (29%), river banks (16%) and other public lands (16%). Specific types of farming systems tend to occur more in some zones than in others (city core, corridors, wedges, or periphery).

91. It should come as no surprise that UA responds to competition for land, as do many other urban land uses. As urbanization proceeds and centrality becomes more valuable, space-demanding forms of UA migrate to more peripheral or less valued locations, much in the same way as do single-storey residences, extensive institutional uses, warehousing and industrial compounds, transportation terminals, and ground-level parking facilities. Urban agriculture that remains at central locations tends to become more labour- or capital-intensive.
92. Dar es Salaam illustrates this trend. In a sector of 26 km² of central Dar es Salaam, UA initially used a vast increase in open public space associated with sprawl; in the 1970s the urban fabric became denser in the sector and by 1981-2 UA had lost ground in terms of total areal, at the same time that it had expanded in cultivated valley land, paddy plots, and vacant land under power lines. Still, a substantial amount of open land remained available within this urbanized sector. The pattern of UA had become more dispersed in the sector by 1991-2, with ground surveys revealing that 64% of gardens were less than 101 m² and 25% under 51 m²; more than 80% of the farmers worked other urban plots at 11–20 km from their houses. Also, households now made more intensive use of their homestead space, with 74% saying they raised livestock; most of the cattle were stall-fed (Sawio, 1993: 137–156). UA therefore does not obstruct more competitive land development; instead, it tends to exploit small, inaccessible, unserviced, hazardous, or vacant areas.
93. That UA is typically opportunistic is anything but the result of chance. Practitioners have developed and adapted a remarkable range of farming systems and crop-selection techniques. This enables them, in principle, to make the best out of climate, site, and other locational constraints and assets in the urban fabric. In Kampala for instance, cocoyams are grown in bottomlands because they tolerate flooding during the rains and thrive on swampland during the drier months (Maxwell, 1994: 54).
94. One survey by the United Nations Development Programme (UNDP) identified over 40 farming systems, each with its own technology, investment needs, yield rates, and returns to labour and risk (Smit and Ratta, 1992: 8): as many as 17 different systems

were in operation in a single LDC city. General categories included aquaculture (aquatic plants and pisciculture), horticulture (household, kitchen, community, and market gardening; roadside, rights-of-way, and streamside horticulture; soilless and vertical horticulture; and special crops), livestock (poultry, cattle, and microlivestock), agroforestry (multipurpose wood production), and others (snail-raising, ornamental fish, silkworms, worm larvae, horses, pets, and medicinal and culinary herbs).

95. Product and technical diversity enables UA to colonize an broad range of niches in the urban ecosystem. This is best revealed by local surveys. For instance, in three different socioeconomic areas of central Dar es Salaam, over the 1968–1982 period, some 260 urban farmers in six farming categories grew 33 different types of crops and 8 types of livestock, on some 11 major conventional land uses and 22 subland uses identified on 1:12 500 air photographs (Sawio, 1993: 153, 277, 284).
96. Crop selection is not haphazard, it depends on local water supply, soil conditions, distance from home, plot size, use of product, and the gardener's control over future use of plot. Over 60 kinds of vegetables were found to be grown by Hong Kong farmers (Yeung, 1985: 20). Tricaud (1988: 11, 33–34) identified some 74 species in Freetown and Ibadan gardens between short-cycle, annual-cycle, and semiperennial crops; they include starchy crops, nuts, legumes, leaf vegetables, condiments for sauces, vegetables eaten raw, fruits, stimulants and medicinal plants, herb teas, spices, extractable products and raw materials, fencing and decorative plants.
97. UA can be an useful way of preserving, exchanging, and experimenting with native plant biodiversity. A series of surveys commissioned by the UN University's Program on Natural Resources in Africa is assessing the use of indigenous African food crops, introduced crops, and imported foods in eating outlets in peri-urban and urban areas. One consultant found as many as 71 different species in a single Nigerian homegarden (Bede N. Okigbo, personal communication, 23 August 1993).

Urban Agriculture is Not Only the Poor's Business

98. Because UA is complex, it clearly is far from being merely a poor person's subsistence, an informal or illegal undertaking. Surveys in middle- and upper-class districts actually unveil a very different arena. The UNDP survey, for example, identified seven categories of urban farmer, embracing a gradation from low-income survival to agribusiness; this includes middle-income home gardeners, low-, middle-,

and high-income entrepreneurs, and farmers' associations and cooperatives. An empirical classification for Kampala also ranges from food-security to market-oriented households (Maxwell, 1993b). Another typology based on the nature of production clearly indicates that some types require much greater inputs than others (Sawio, 1993).

99. According to the Sokoine University of Agriculture's survey of 1 800 farmers in six Tanzanian cities, for instance, animal breeding is a money-maker for top executives; 65% of all livestock kept in Dar es Salaam in 1987/88 were found in a low-density and formerly colonial, now elitist, area (Mvena et al., 1991). A three-district survey in Harare showed that 80% of Glen View (government and services) and Mabelreigh (middle-class suburb) had gardens with some food crops (Drakakis-Smith, 1990). In Dar es Salaam, urban farmers were evenly distributed across educational levels; 86% of interviewees agreed that high income earners are doing the most urban farming (Sawio, 1993: 221, 228).
100. Truly, UA can get really big. In Bangkok, a single large firm contracts about 10 000 outgrowers of chickens while it runs hatcheries and dressing plants; it controls major shares of the national and export markets. International agribusiness produces mushrooms in Jakarta. Bogotá exports carnations to New York; Shanghai, orchids to Paris. California-based corporations own major shares and assist vineyards inside Santiago, Chile (DGIP/UNDP 1992: 23).

Urban Agriculture is Not for the Neophyte

101. Even among small producers, because of its resource needs, UA is not the accidental or temporary business of mostly recent immigrants from rural areas (Drakakis-Smith, 1992: 5). In the small town of Pointe Noire back in 1958, Vennetier (1961: 72) had found that the largest field area was in hands of people who had been living for 5–20 years in that city. More than 60% of Lusaka's urban farmers had been in the city for more than 5 years before starting their plot gardens, nearly 45% had not farmed for the first 10 years (Sanyal, 1986: 15). In Nairobi, urban farmers' average period of residence was 20.4 years and 85% had resided for at least 5 years, 57% for 15 years or more, and 15% for more than 40 years (Lado, 1990: 262). Tricaud's (1988: 8) survey of 100 gardeners in Freetown and Ibadan, Sawio's own (1993) in Dar es Salaam and others show similar findings. Most urban farmers have other part or full-time jobs. Even in small Pointe Noire, only 17 out of 266 interviewed farming

heads of household could be found to be jobless; the rest were nonskilled manual workers, construction workers, and mechanics (Vennetier, 1961: 72).

Conclusion

102. Urban farming as a basic urban function is nothing new; in fact it seems to be as ancient as cities themselves. At the dawn of the 21st century Asia is leading the "South's way" in the sector, with highly organised and competitive systems for the production and marketing of urban agriculture. However, since the late 1970s the literature has been unveiling the growing incidence of the sector in many other developing regions. Factors encouraging this expansion were discussed in this chapter. A noteworthy trend is that more governments are introducing institutional and other policy changes which recognise and tolerate, manage and promote the activity.
103. Paramount to justifying and encouraging this change of attitude is the mounting evidence on UA's contribution to urban food security. Urban food supplies in developing countries can no longer be taken for granted and there is ample evidence from world cities that food is turning into a basic luxury for the urban poor in particular. These findings are collapsing the myth of urban privilege over rural neglect, as far as food security is concerned. Urban food production has grown into a complex and thriving industry, in terms of practising households; it supplies many nutritious food items to urban markets. Also, there is a growing body of data on the benefits accruing to practising households, in terms of self-grown food intake, child nutritional status and general health, cash savings and income. The unfolding evidence should gradually lead the community of humanitarian organisations and others to incorporate UA into more sustainable and cost-effective food security strategies.
104. In an urban planning perspective, surveys systematically point to the fact that the area or space effectively being used by UA activities is very much greater than conventional classifications and land-use maps may capture. It must be recognised that UA is virtually ubiquitous because it is remarkably adaptive and mobile. UA is so typically opportunistic because practitioners have evolved and adapted remarkable know-how to select and locate, farm, process and market plant, tree and livestock types in the urban fabric. What they have achieved and dare to pursue despite minimal support in the very heart of our major metropolises is often a resounding tribute to human genius.

105. Perhaps some of the more startling revelations of surveys in store are that UA is far from being merely a poor person's subsistence, an informal activity, or an illegal business. It is even less so the accidental or temporary pursuit of mostly recent immigrants from rural areas. Above all, UA in the South generally replicates on a massive scale space-starved efforts of ever-urbanising peoples to fend for the very basic, without which there can be no sustainable city, economy, or government: reliable and sufficient supplies of good-quality food affordable by most urbanites.

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PROMOTING URBAN AGRICULTURE: A STRATEGY FRAMEWORK FOR PLANNERS IN NORTH AMERICA, EUROPE AND ASIA

SUMMARY

Urban agriculture is an integral part of life for hundreds of millions throughout the cities of the world. Many valuable programming lessons have been learned from activities in Asia, Europe, and North America. These experiences need to be shared with city planners and managers in order to further refine on-going efforts and spread the benefits to those denied access to urban agricultural activities.

The first part of the paper will present a general description of the significance of urban agriculture; who practices it, why they do it, and where its done. The second part presents a planning framework for expanding urban agriculture activities or for establishing an urban agriculture program.

THE SIGNIFICANCE OF URBAN AGRICULTURE

If there is one common denominator amongst urban people of the world it is agriculture. Urban agriculture, the production of crops and livestock, is practiced by people from all walks of life. Elites and social welfare recipients; gang members and ladies clubs; the physically and mentally impaired; seniors and kids alike. They grow for different reasons, in all types of locations, and use very different production methods. The numbers show just how significant urban agriculture is:

- In Poland 28% of urban families are involved in urban agriculture activities. There are over 900,000 plots on 42,000 hectares of land. It is estimated that a further 700,000 families are waiting to purchase a garden plot. (Smit, et al. 1993) Approximately 30% of Russian food is produced on only 3% of the land in suburban "dachas". (Center for Citizen's Initiatives 1993).
- In former West Germany, 800,000 garden allotments covered 24,000 hectares.
- Urban agriculture in the Netherlands is estimated at 33% of total production. Plans call for a "rim city". Rotterdam to Amsterdam will serve as the "tire" with agriculture as the "hub".
- Urban agriculture in Sarejevo is alive and growing. Since the start of the blockade 2 years ago food production, especially in vegetable and small livestock is estimated to have grown from 10 percent to over 40% self-reliance in these commodities.
- In the United States metropolitan areas contain 33% or 696,000 of the estimated 2 million farms in 1991. These farms, which operate on 16% of farmland, account for 35% of all crops and livestock sales. (Heimlich and Barnard 1993). Approximately 25% of all households are involved in urban agriculture. Estimates of \$38 million dollars of food are produced from urban plots. 1000 greening projects.
- New York City has over 1000 community gardens; Boston 400; San Francisco 100. Philadelphia's "Green" Program, established in Canada, also has an impressive record in urban agriculture. Montreal has 10,000 allotments. Toronto has nearly the same number. Vancouver's "City Farmer" Program has been running for 20 years.

URBAN AGRICULTURE'S MULTIPLE PURPOSES

The reasons why agriculture is practiced in urban areas vary as much as the produce in

the gardens. For the poverty-stricken it is often multi-purpose and a question of survival. For the economically secure it is for exercise and recreation. Gardens also serve as a tangible form of cultural preservation.

FOOD

For Poles, urban agriculture plots provide one out of every 15 kilograms. For retired persons it is one out of every seven kilograms. The cropping pattern is designed to maximize production. The garden structure is often a three-layer system with fruit trees at the top, berries below and, on the lowest layer, vegetables (Smit et al, 1993).

Most households in the Southeast Asia and Pacific Island Regions practice urban agriculture for a single reason: food. It is often the most direct means for obtaining a fresh, continuous, and healthy food supply to supplement the main parts of meals.

A home lot will often contain more than 50 different kinds of plants, mixed together with livestock and, where feasible, fish.

In South Pacific cities urban gardens often contain crops grown traditionally in outer-island gardens. Traditional root crops and vegetables are often too expensive for the poorer segments, so these grow their own.

The small food gardens of Yerevan, the capital of Armenia, are frequently a major component in a household's survival strategy. Seedlings are raised in homes during the long snow-filled winter. At the first possible opportunity to plant, mobs of people can be seen busily planting every space available in their garden.

A typical garden contains a multi-layer mixture of Mediterranean-type vegetables, spices, herbs, fruit trees and grape vines. Once produce is ripe almost all crops are home-preserved.

For the temperate climates of North America and Europe what portion of food needs can be met from an urban garden? The answer depends on a number of physical and climatic factors. One estimate is that a 10 meter by 10 meter plot in a 130-day growing season will produce enough vegetables to supply most needs year round. Nutritionally the plot

would provide most of the vitamin A,C, and nearly 1/2 of the vitamin B complex and iron (Minnich,1983).

INCOME

Income generation and savings are also major factors for undertaking urban agriculture. In Bangladesh 10% of the total family income is often derived from small homelot food gardens. (AVRDC,1991) In Honiara, the Capital of the Solomon Islands, surveys show that families save up to 20% from their previous food bill by now growing food that they once purchased (Solomon Island National Nutrition Survey, 1991).

Ringed nearly every major Southeast Asian city are small, intensively cultivated plots of vegetables. They are usually buzzing with activity as produce is harvested and sold continuously. The mini-states of Singapore and the Territory of Hong-Kong, with some of the highest population densities anywhere, hardly come to mind when thinking about urban agriculture. However both places have thriving commercial food and flowers enterprises. It is estimated that they are both 30-50% self-reliant. In the major cities of the Southeast Asia, where land is available, households often design their productive land so that it has a multiple function. A portion of the produce is used for home consumption and another is sold.

U.S. urban farms sell 13 times more per acre than non-urban farms. (Heimlich and Barnard 1993). A League of Women's Voters survey suggests that 80% of urban buyers are willing to go the extra length to buy locally. The growth in the Montepiller, Vermont's weekend farmer's market, reflects the survey results. Small farms near the city are using more organic or environmentally friendly methods as their urban clientele tend to favor natural methods of production. (Pulver 1993).

Restaurants in Chicago and Washington D.C. buy over 80% of their vegetables from locally grown sources in season. The "Greens" Restaurant, one of San Francisco's most popular eating establishments, is known for its nature-friendly fresh produce. It uses "greens" from its Zen Buddhist organic farm in Marin County, some 15 miles away. (Alexander,1983).

Along the Southern California Coast, where real estate prices are some of the highest

in the US, urban agriculture is alive and well. Ornamental, especially cut flowers and potted plants are commercially grown in green houses and open fields next to homes valued at \$500,000.

The Los Angeles riots of 1992 illustrated the need to engage youth in meaningful economic activities. Urban agriculture has proven to be a successful example of how to attract youth do undertake constructive work. Post-riot rehabilitation funds were used to create a 7.5 acre community garden. Over 100 families are involved. In a related project, gang and potential gang members are involved in raising a variety of salad herbs and spices. Their garden produce is used as ingredients in a salad oil that is marketed in South-central L.A. and other parts of Southern California.

RECREATION

Europeans love their gardens. The situation in Zurich is typical of most European cities. One of the most sought-after urban privileges is being allotted a piece of garden land near your residence to create your own world of food and flowers. In Berlin 15% of the city is used for urban agriculture activities. All 80,000 garden allotments are occupied with a further 14,000 persons on the waiting list. Annual rents are as high as \$400.00 US. In the growing season, especially on weekends, families can be seen tending their gardens and sipping refreshments in front of their tiny cottages built as part of their garden allotment.

CULTURAL PRESERVATION

In the Makaha area on the Island of Oahu, a native Hawaiian group has developed a parcel of land that is both a working farm and cultural preservation site for native traditional Hawaiian plants and cultivation practices. In Tauton, Massachusetts, it is easy to identify homes owned by families of Portuguese decent: the lots are covered with grape vines (Treves 1994).

ADAPTION TO THE URBAN ENVIRONMENT

Urban agriculture fits no specific geographic location. It is done wherever land is available. Private lands, public lands, legally and illegally. In many low income urban communities on the East Coast of the US, abandoned lots which added to the urban decay scene are now being converted to community garden sites, managed by local community residents:

- The Green Guerrillas in New York City are helping to establish gardens, wherever space is available in Harlem, the South Bronx, and the Lower East Side.
- The Chicago Botanic Garden's "Green Chicago" outreach program helps neighborhoods to create gardens, especially on the South and West sides.
- The Tilth Group in Seattle has the P-Patch Program that works with neighborhoods to create gardens.
- In Hawaii, the Honolulu City Council allots land along the Ala Wai waterway. They provide improvements including fencing, water facets, and storage sheds for tools.
- In L.A.'s densely populated San Fernando Valley, which was once all agriculture, the only remaining large, scale urban agriculture is done in the floodplain area. Commercial enterprises grow sod lawns and summer vegetable crops on lands leased from the city.
- In Yerevan, the sky over city streets serve as food growing sites. Grape vines are trained on trellises to arc over roads.
- Rangoon, Manila, Jakarta, Bangkok, etc. small water-loving crops are grown in canals that run in front of houses.
- In Suva, Fiji and Stockholm front lawns are quickly being converted to food crops. In parts of Taipei, food is grown on trellises over water canals as well as along rail lines. Nearly every square meter of land is planted to

something. Floating gardens, constructed on bamboo rafts, can be seen in front of homes along many of the canals or waterways of Bangkok, Thailand. Homelots on the edge of Hanoi City use an agricultural system locally known as VAC. Crops (food and flowers), livestock, and fish are grown in a closed agro-ecosystem. Each part of the system uses and supports the other. Balcony and roof top gardens are common place in European, North American and Asian cities.

In sum, urban agriculture is practiced by millions from all walks of life; is done for a wide variety of reasons: income, nutrition, recreation etc.; is undertaken wherever land or space is available: homelots, public access areas, abandoned or vacant lands, balconies, canals, rooftops, etc.

The success of urban agriculture is a result of both individual efforts and government-supported initiatives. What should be the role of urban planners and city managers in accelerating the expansion of urban agriculture activities?

CHALLENGES FACING THE FURTHER DEVELOPMENT OF URBAN AGRICULTURE:

Urban agriculture is a city planners' dream. All issues should be so easy to work with. Urban agriculture fits into nearly every major on-going program in urban centers today. These activities include environmental improvement, solid waste management, crime prevention, health care, child nutrition programs, redevelopment/inter-city enterprise zones, and education.

The strategy framework for strengthening and accelerating urban agriculture is straightforward. A strategy workshop on urban agriculture is an effective method for raising its profile. The workshop could review current city government programs; identify opportunities for including an urban agriculture component into existing programs; identify resources from government and the private sector that could be tapped to carry out activities (Sommers, 1991).

1. ENVIRONMENTAL IMPROVEMENT

There is near universal agreement that protection and further enhancement of the

physical environment in urban areas is a top priority. Urban residents need greenery and they can be quite militant about it. The 1960's "Peoples Park" saga in Berkeley, California, is an example of the level of aggressiveness with which some are willing to protect greenery and prevent the spread of the asphalt jungle.

Promotion of urban agriculture as part of an urban environment policy is logical. As discussed previously, Europe, and North America have undertaken various practical agricultural programs which have resulted in environmental enhancement. Asia in general has lagged behind North America and Europe in effective programs to curb pollution. Polish and Armenian garden plots use ecological cultivation methods and agro-techniques of intensive production which conserve and enhance the local environment. Chicago's Urban Forest Climate Project has been studying the effect of vegetation on the city environment. The study's conclusion: a program to plant trees and create forest-like conditions has a positive cost-benefit ratio (Mc Pherson, E.G. et al,eds, 1994). The City of London was planned as a city with a 'green rim' of agriculture and forestry around it. It has not worked out as well as other cities on the continent.

Land-use planning was strictly controlled in the former USSR and parts of Eastern Europe. Extensive use of high-rise flats insured that prime agriculture land was preserved. Most cities are heavily planted. Main streets are lined with trees and neighborhood parks abound. This is not the case in Armenia. Yerevan's urban forest is rapidly disappearing. Due to a chronic energy crisis resulting from a combination of the collapse of the USSR and continuing economic blockade, the residents of Yerevan are busy cutting trees all over town. Stumps have replaced tree-lined streets. It is estimated that Armenia has lost over one million fully mature trees in the past few years. There is no end in sight. (Armenian Assembly of America 1994)

2. WASTE MANAGEMENT

The issue of what to do with an ever-increasing amount of refuse is a chronic problem. They are expensive to operate and fraught with environmental challenges. In recent years a number of cities have introduced varying types of recycling programs to deal with the solid waste issue.

Urban agriculture should be a component of any solid waste policy. The City of Los Angeles has a pilot project in which residents must separate organic refuse from gardens

and lawns from solid waste materials, such as glass and cans. These organic materials could be converted to useful products for urban agriculture activities.

This is already being done in parts of Asia and the South Pacific. In the Solomon Islands approximately 75% of total refuse put out for collection was organic and recyclable. The government felt that collecting this type of material was costly and unnecessary. It used a two-pronged strategy for addressing the issue. A radio campaign was designed, urging residents to recycle the organic material back into their homelot gardens. The second activity was the decision to earn revenue from the material. The organic refuse was picked up and taken to a site where was composted. The processed material was then offered for sale to the public or used to improve public parks and gardens. Observations show that households have listened to the radio campaign and responded by burying their organic refuse in their gardens.

A section of Fiji's Suva City Refuse Center has been converted into a commercial enterprise producing flowers and ornamentals. Since ornamentals are not consumed it was felt that the rich organic area, which had developed as a result of continuous dumping of organic material, could be safely used to produce non-edible plants.

3. CRIME PREVENTION

At the top of issues concerning urban residents in North American and Europe and an emerging issue in Asia is the perceived rising violent-crime rate. Statistics show that teenagers and young adults are responsible for the majority of violent crimes. Those that commit crime or are predisposed to commit crime often list lack of activities and jobs as a major reason for turning to criminal activities.

Urban agriculture has been used successfully as a method for deterring would-be criminals and turning them into productive citizens. One success story is with L.A.'s inter-city youth-who are growing a variety of salad herbs and spices and producing a commercial salad dressing. San Francisco has a prisoner training program that continues beyond release from prison.

4. URBAN REDEVELOPMENT

Decay is a part of urban life, in the US and parts of Europe. Every major city has sections that are characterized by abandoned or condemned buildings and debris-filled lots. These are environmental nightmares: they are physically unsafe and often serve as magnets for criminal activity. Urban agriculture should form a part of any programme that deals with urban renewal. The United Kingdom cities of Sheffield and Birmingham have converted abandoned industrial areas into urban agriculture sites. Successful examples mentioned previously from North American cities show that local communities will respond to the challenge of cleaning up vacant lots and transforming them into green centers for food and recreation.

5. INTER-CITY ENTERPRISE ZONES

Urban agriculture should be a component of any plan to establish an inter-city enterprise zone. Opportunities for the production of food and ornamentals abound. There is a need for small-scale food production centers specializing in ethnic foods and spices particular to the local residents in the nearby area. Ornamental horticulture is particularly well-suited to sites with limited space. Flowers, indoor as well as outdoor plants, can be grown under nursery conditions. Supplying neighborhood offices and businesses with fresh flowers and indoor plants through plant "rentals" are two very real possibilities.

6. CHILD NUTRITION PROGRAMS

The nutritional status of low-income urban residents is disturbingly low, especially in some major US cities. Micronutrients that are present in fruits and vegetables are often consumed at rates below the minimum daily suggested intake. Since a young child needs only one cup of vitamin-rich vegetables daily to satisfy micronutrient requirements, urban food production may offer a partial solution to the nutrition problem.

A wealth of experience is available from the developing world on planning for nutrition improvement through urban agriculture. Two particularly successful programs are the Solomon Islands "Sup-Sup" Garden Project and the Thailand Vitamin A Improvement Project. The combined efforts of the Honiara City Council and the Sup-Sup Garden Club increased the total number of homelot food gardens by an impressive 20% in two years (Schoefield 1991). The New Zealand Department of Scientific and Industrial Research

Organization report identified the key elements in the successful promotion of urban food gardening:

- Thorough analysis of the factors impacting of child malnutrition.
- Identification of solutions using existing knowledge, skills, and resources of nutritionally at-risk households.
- Establishment of a neighborhood garden service center which provided: planting material and garden supplies from organic and solid waste materials, demonstration plots showing small-scale intensive food gardening, technical assistance at both the garden service center and through visits to individual gardens, and a mass media campaign (Sommers 1991). The Thai Project, Social Marketing of Vitamin A-Rich Foods, used a similar strategy to the Sup-Sup Garden Project. The main difference in the Thai project was the promotion of a single food, ivy gourd. An initial review shows that production has expanded and an increase in consumption by children has been recorded.

(AVRDC 1991.)

Urban agriculture improves access by the poor and all residents to good healthy locally grown produce. Mothers and/or care providers receiving assistance from government nutrition programmes in North America and Europe could be encouraged to engage in small-scale food-growing activities.

7. HEALTH CARE

The debate on what to do about universal health care rages on in the US. There is little argument that people need to take more responsibility for their own health, especially in making health food choices and in preventing non-communicable or life-style diseases. The cost to city governments, in terms of treatment and lost revenue from worker illness, is unacceptably high. Urban life characterized by a sedentary life with a minimum of physical activity is conducive to a number of health-care problems. Most of these are unnecessary and preventable. Most health experts agree that the key to preventing many non-communicable health problems is a combination of moderate exercise and healthy eating habits, including a large portion of fresh fruits and vegetables. One hour of moderate work over a one week period (digging, planting, cultivating, etc.) will provide a significant amount of exercise to keep healthy.

In the Central Pacific atoll country of Kiribati, one urban district medical program used

urban agriculture as a main primary health-care strategy. It had become difficult for government to provide hospital care. Records showed that the majority of requests for hospital admission were for illnesses related to lifestyle including cancer, hypertension, diabetes, and health disease. The central hospital decided on a two-pronged strategy to address the health-care crisis: reserve hospital services for mainly emergency injury cases and limit the number of patients with life-style diseases. Instead the public health staff would begin a campaign to promote food-growing. The theme of the campaign was to encourage people to take more responsibility for their own health situation. The treatment: more exercise and increased consumption of fresh produce. The method: homelot food-gardening. The chief medical officer, who became known as the garden doctor, on personal visits to his patients showed that most had started small food gardens and were actively involved in the production and consumption of the produce. (Takatio, 1985)

8. EDUCATION

The issue of providing meaningful and relevant education to today's youth is an on-going challenge. Should urban agriculture be a part of the curriculum? All of the issues raised above clearly point to the fact that urban agriculture is a relevant and potentially vibrant part of urban life.

A couple of options present themselves for inclusion of urban agriculture in the educational system. The role of urban agriculture should be blended into existing curriculums. The Vermont-based Food Work's Project has developed a primary school curriculum based around agriculture and the environment (Peduzzi, 1993).

Guidelines for including urban agriculture could be developed and presented through in-service training courses. Another opportunity is through the offering of urban agriculture as an occupational training course. The L.A. Unified School District, through its Occupational Center Program, offers certificate courses in agricultural occupations relevant to the urban environment. Young adults, out-of-school youth, and adults needing to be retrained develop business and technical skills in nursery management and lawn and garden maintenance. The Los Angeles Tree People teaches urban ecology to over 60,000 school children each year.

This paper was designed to stimulate creative thoughts on ways to effectively plan for

urban agriculture. In sum, urban agriculture is alive. Its roots are firmly planted in the cities of the world. It has grown through individual initiative as well as through government and non-government organizations.

Cities that have urban agriculture programs need to expand them. Those that don't need to start. Perhaps no other activity touches so many aspects of urban life. The benefits of urban agriculture are known. With effective planning urban agriculture can grow and blossom into its full potential.

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URBAN AGRICULTURE AND THE SUSTAINABLE DAR ES SALAAM PROJECT, TANZANIA

Abstract:

As 1990s pass and give way to the 2000s more human beings will be so urban-based and the challenge of feeding cities will be real that any opportunity that attempts to reduce the burden cannot go unnoticed. Urban agriculture, perceived in terms of the needs for building sustainable human settlements, is unquestionably, an urban management tool that realistically addresses poverty, income and food issues, and rightly orient managers of human settlements in the spirit of "building with nature". In Dar es Salaam and several towns in Tanzania, urban agriculture is here to stay not only for reasons of urban food security but also because of its potential significant contribution to the city economy. Ongoing research on UA in collaboration with IDRC and SDP through UNCHS anticipates positive contributions toward potential action lines and potential management option as depicted in Figure 1-2.

1.0 INTRODUCTION

Urban agriculture (UA) is increasingly becoming an important socio-economic change in contemporary Third World urbanization. UA, hitherto a neglected area of study, is capturing growing attention of researchers and international bodies concerned with sustainable human development. UA appears to be a new and prevalent urban reality today, even though its practice is centuries old (Silk, 1986)¹.

¹

Dana Silk (1987:14-15) argues that "ever since have been living in cities, food has been grown in cities. In ancient Greece food was grown in earthenware pots; in Roman days it was grown in the windows and balconies. Dr. Luc Mougeot of IDRC observes that urban food production existed in the Inca, Aztec and Mayan cities, Javanese and Indus towns and those in the Tigris and Euphrates valleys (IDRC Reports, Oct. 1993:2).

Urban agriculture is emerging in both the North (industrialized) and in the South (developing) countries as an important socio-economic and spatial phenomenon in the so-called informal sector. Indeed, UA is more and more a prevalent phenomenon in developing world cities where it has been tolerated. Recent studies on urbanization in Africa and elsewhere have documented the potential of urban and peri-urban agriculture in the economy of city systems. As a matter of fact, urban agriculture is potentially a socio-economic survival strategy² for urban poor residents for food and employment, and it may contribute to the livelihood strategies of the "better-off", and it makes use of 'idle resources' in the urban ecosystem which would otherwise go to waste (Sawio, 1993:7-8).

1.1 Practice of UA and What it Includes

To appreciate the significance and contribution of urban agriculture to modern urban living, particularly in the rapidly urbanizing developing countries, it is worth noting that the phenomenon is a reality we cannot ignore because it exists and is perhaps growing as socio-economic hardships intensify; and it does not concern itself exclusively with food production. Urban agriculture is potentially a "major strategy to productively and equitably tackle water, waste and hazard problems in large urban centres, particularly as these affect the poor." (Mougeot, 1993:24).

The larger context to situate research and practice of urban agriculture is the building of sustainable human settlements. In Agenda 21 of the Earth Summit held in Rio in 1992, it is clearly stated that in order to promote sustainable human settlements, various activities must be undertaken to improve urban management and to alleviate urban poverty by:

- (a) Generating employment for the urban poor, particularly women, through the provision, improvement and maintenance of urban infrastructure and services, and the support of economic activities in the informal sector, such as repairs, recycling services and small commerce;
- (b) Providing specific assistance to the poorest of the poor through, inter alia, the creation of social infrastructure in order to reduce hunger and homelessness, and the provision of adequate community services;

² cf. Sanyal, 1984, 1986; Mwamfupe, (1994:iii).

- (c) Encouraging the establishment of indigenous community-based organizations and other forms of non-governmental entities that can contribute to the efforts to reduce poverty and improve the quality of life for low-income families (Agenda 21, UN, 1992:52).

Urban agricultural activities can be carried out in (i) small open spaces as well as large ones in built-up areas, and in (ii) the urban fringes. Thus, we use the terms "urban agriculture" to refer to the former and "peri-urban agriculture" to the latter.

As a concept and process, urban agriculture includes food production (all kinds of crops and fruit growing) and livestock keeping in and around cities (Yeung-Yeu-man, 1987). Sanyal (1984) terms urban agriculture as:

"an essentially copying strategy adopted by households whose monetary incomes are insufficient for purchasing adequate amounts of food. He adds, however, that it is practiced by households who enjoy cultivation because of their past experience" (Sanyal, 1984:40).

Other researchers have noted that urban agriculture encompasses formal cultivation and many more things including: fruit growing, container gardening, use of marginal areas such as road reserves, basements of abandoned buildings, boxes, canals, vacant land in towns, aquaculture (pond-fish farming), urban horticulture (vegetable and fruit production in urban and peri-urban areas), floriculture (production of flowers and urban ornamental trees and small plants), backyard and frontyard gardening, micro-livestock keeping, hydroponics, roof-top gardening, biodegradable waste recycling (composting), and more. Smith and Ratta (1992:8) have produced a summary of what UA includes as depicted in Table 1-1.

Again, in order to understand the significance of UA in Dar es Salaam and other cities and towns in Tanzania, as well as official attitudes for or against it, as well as its role in urban planning, a word on the general perception and challenge of urban agriculture is worthwhile at this juncture.

Table 1-1 Urban Agriculture (Farming System Groups)

Horticulture	Aquaculture	Livestock	Orchards/Woodlots
Vegetables ornamental, other crops in/on:	Fish, shrimp, seaweed, duckweed, etc. in:	Micro- (guinea pigs, rabbits, poultry), larger animals;	Fruit, other plants and fuelwood in/on:
<ul style="list-style-type: none"> ■ backyards ■ rooftops ■ vacant lots ■ community gardens ■ roads & waterways ■ grounds of public & private institutions ■ suburban farms ■ garbage land fills 	<ul style="list-style-type: none"> ■ rivers ■ ponds ■ coastal bays ■ sewage lagoons ■ 	<ul style="list-style-type: none"> ■ backyards ■ rooftops ■ along road sides ■ suburban farms ■ parkland ■ urban forests 	<ul style="list-style-type: none"> ■ vineyards ■ parks ■ institutional grounds ■ roadsides ■ backyards ■ hedgerows

Source: J. Smit & A. Ratta, in Hunger Notes, Fall, 1992, p.8.

1.2 Perception and Challenge

1.2.1 UA vs Western City Beauty

That urban agriculture is prevalent and is becoming almost a permanent feature in such cities as Dar es Salaam, Morogoro, Dodoma and Arusha in Tanzania; or in Nairobi, Kampala, Lusaka, Addis Ababa, Kinshasa, Harare, Manila, Beijing, New York, Boston, Hartford, and so many other towns and cities in the North and in the South clearly challenges received concepts and common perceptions among mainstream urban economists and planners which persistently insist that agricultural activities in cities are a contradiction of the common image

of the city (Sawio, 1993:1). It is expected that the traditional urban planner, the architect, the industrialist, the politician and other decision-makers, **urban agriculture** detracts from the images of the 'ideal, planned and modern western city'³. Viewed thus, it is not surprising that city authorities and other urban decision-makers, in general, perceive urban agriculture negatively as a remnant of an outmoded, transitory activity typical of rural living where people handle dirt.

1.2.2 The Burden of Feeding Urban Masses

But as the pace of urbanization in Africa and the rest of developing countries increases and most people become urbanized in the context of stagnating economies, environmental degradation, rapid population increase, dwindling industrial and other formal job opportunities, as well as insecure rural and urban domestic food supplies, feeding urban masses is surely a critical problem of immense proportions.

1.2.3 The Challenges UA Poses

Undeniably, the rise of urban agriculture in the North and in the South, particularly in the production food crops and rearing of livestock to feed people in times of economic and environmental resource constraints, challenges modern settlement experts and urban planners in matters of land use allocation and architectural design; while at the same time highlighting on the significance of peoples' struggle for survival. The challenge calls for the changing of attitudes regarding who should live and do what in an urban area. It means devising creative means to utilize resources in urban systems that are idle or underutilized; making towns, cities economically more productive; and finally taking seriously the challenge that urban centers and cities should not be seen as characterized exclusively by 'non-agricultural economic functions'.

1.2.4 Rebuilding in Balance with Nature

The challenge is made clearer by the fact that, today than ever before, there is a need to build new cities and rebuild old ones in balance with nature because:

³

But the majority of participants in an International Ecocity Conference in March 14 - April 1990, Berkeley California observed that much of the western city needs to be rebuilt given its estrangement from nature. One of the things emphasized is development of urban agriculture.

"..cities can be whole, vital, healthy creations in which architecture, transportation, land use, food growing, natural restoration, social and political arrangements can play their role connected in meaningful ways to all other systems and subsystems of the city."

"Some of the necessary steps toward rebuilding our cities in balance with nature include the creation of new affordable housing near existing transit services, establishment of urban agriculture, creek restoration, urban forestry, and effective "pre-cycling" and recycling programs. Instead of sprawled suburban development, boundaries between cities and natural areas would be green belts, woodlot and local farmlands." (Register, 1990:16).

2.0 THE FOCUS OF THE PAPER

The paper started by outlining the context that reflects new thinking on sustainable human settlements and where UA comes in. The rest of this paper comprises four parts. The first briefly introduces Urban Agriculture in Dar es Salaam in the context of the Sustainable Dar es Salaam Project. The second discusses the significance of UA in Dar es Salaam and a few other towns where UA research has been conducted. The third describes some official attitudes towards UA, and the fourth discusses the role of UA in urban planning and the constraints that must be overcome in Tanzania in order to make UA a management tool for the realization of sustainable cities.

3.0 URBAN AGRICULTURE IN THE CONTEXT OF THE SUSTAINABLE DAR ES SALAAM PROJECT

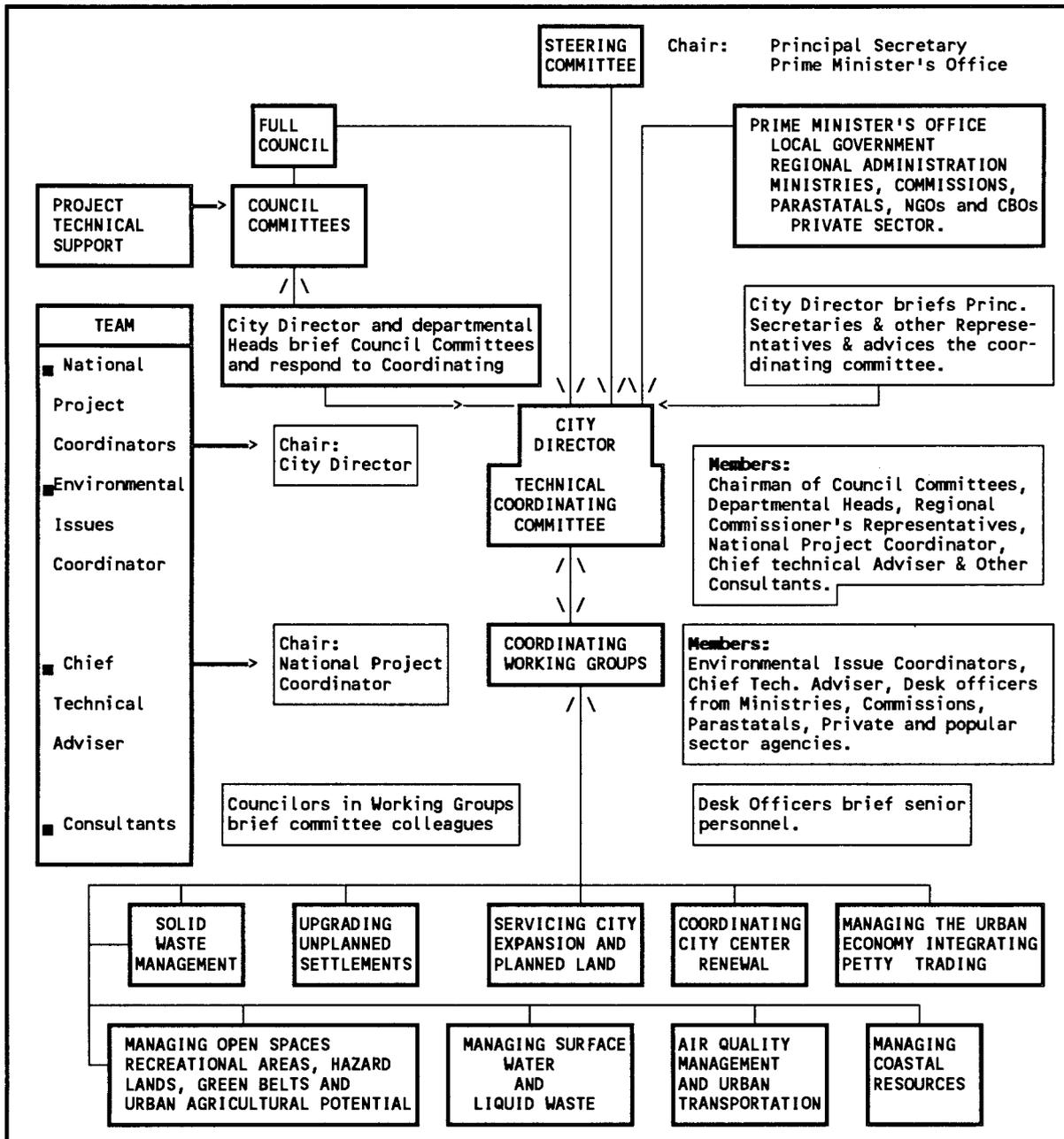
Following the establishment of the Sustainable Dar es Salaam Project (SDP) under the Global Sustainable Cities Programme of the United Nations Center for Human Settlements (UNCHS) it was recognized that the deteriorating environmental conditions in Dar es Salaam, a rapidly expanding and densifying city, represented major constraints to achieving sustainable and equitable socio-economic growth and development of the city. After a successful Consultation on Environmental Issues for the Management of the Sustainable Growth and Development of Dar es Salaam from August 26 to September 1, 1992, the Environmental Profile of the city was completed as illustrated by Figure 1-1.

In the City Declaration, it was recommended that one of the many priority issues to be addressed by the city council with support from SDP is the Management of Open Spaces, Recreational Areas, Hazard Lands, Greenbelt and Urban Agricultural Potential (see Figure 1-1). These environmental issues cannot be dealt with in isolation, they must be tackled in an integrated way, in relation with other issues under coordinated working groups.

The overall framework in Figure 1-1 was supported by the Local Government through the Prime Minister's Office (PMO). Regarding urban agriculture, a working group within SDP has been formed and work is proceeding on well. The current on-going research on urban agriculture and environmental planning and management in Dar es Salaam, supported by IDRC and UNCHS is taking into account the pertinent issues identified in the Dar es Salaam Environmental Profile.

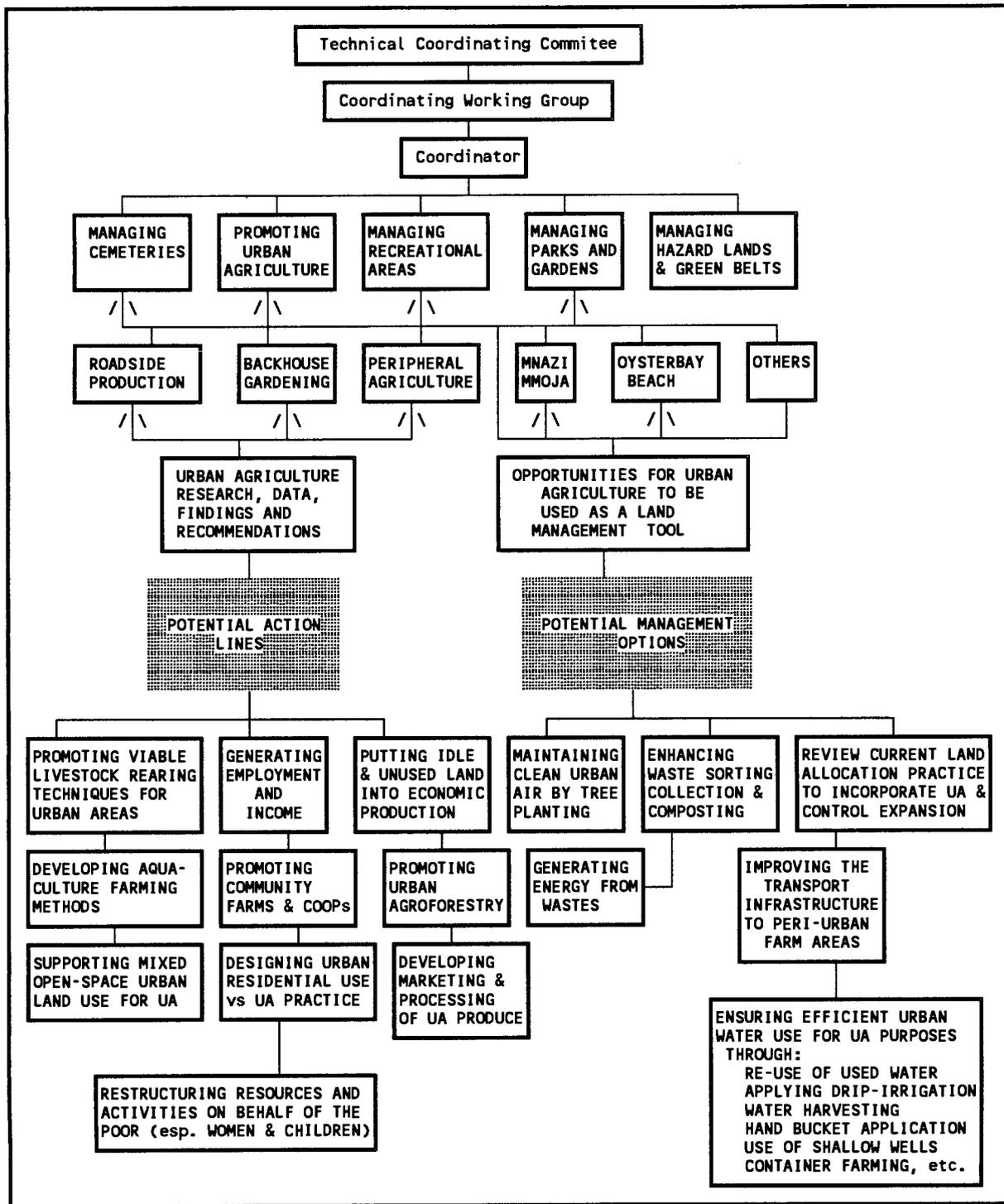
In attempting to integrate urban agriculture and open spaces, recreational areas, hazard lands and greenbelt, a number of relationships can be envisaged. These potential relationships are illustrated in Figure 1-2. The figure builds on SDP's environmental issues identification in preparation of the environmental profile, but as it appears here it has been modified to reflect what we may consider to be potential action lines and management options. These are outlined in order to reflect urban agriculture research, anticipated findings and recommendations that may be applied to Dar es Salaam or any other city. The following section discusses the significance of urban agriculture in Dar es Salaam with a number of references to other cities in Tanzania.

**FIGURE 1-1: SUSTAINABLE DAR ES SALAAM PROJECT - DRAFT
CONSTITUTIONAL FRAMEWORK**



Source: Sustainable Dar es Salaam Project, 1993, Environmental Profile.

FIGURE 1-2: RELATIONSHIP BETWEEN URBAN AGRICULTURE AND MANAGEMENT OF OPEN SPACES, RECREATIONAL AREAS, GREEN BELTS AND HAZARD LANDS



/\ = Show the relationship between research on urban agriculture and the opportunities for urban agriculture and the management of the identified environmental issues (& proposed action & management options).

Source: Adapted from SDP, (cf. Sawio, C. & Kishimba, M. 1993) unpublished Report on a One Day SDP Workshop on Urban Agriculture in Dar es Salaam. *The figure was modified to reflect the potential action lines and management options.*

3.1 Significance of Urban Agriculture in Dar es Salaam and Selected Cities in Tanzania.

The significance of urban agriculture can be perceived in a number of ways, ranging from amount of land under UA practice to levels of income generated, amounts of food produced, variety of crops and livestock kept and so on. The following sections will discuss a few of such areas.

3.1.1 Urban Land Use and Area under UA

In Dar es Salaam, analyses of land changes resulting from population increase and city expansion show increases in use of different categories of land including urban agriculture. According the Dar es Salaam Environmental Profile (Baruti et al., 1992) Dar es Salaam has a total land of 1,350 Km² about 430 Km² are for urban development and immediate expansion, 20 Km² are for forest reserves and 900 Km² are suitable for agricultural development.

Urban agriculture in Dar es Salaam, in relation to other land uses takes place in small open spaces, in valleys, vacant land, land around residential areas and institutions and in the peri-urban areas. Analysis of aerial photographs since 1966 show dominance of agricultural land in unbuilt-up areas, and in 1978 for example land use changes show that some crops had been squeezed out of the city area. Due to the increase of population and the struggle for survival, every portion of land that can be put to use is utilized, and UA is practiced in all kinds of spaces today. The same appears to be the case for such towns as Mbeya, Kilosa, Morogoro, and Arusha (Mvena, et al., 1991).

Sawio (1993) noted that even as the city expanded outward, land for UA still remained. Even in the more urbanized areas as Kinondoni, Mwananyamala, Oysterbay and others, urban agriculture is prevalent. By 1992, Mwamfupe (1994) and Sawio (1993) observed that agriculture still dominated land use in the city's open spaces and river valleys. UA is widespread in low density areas in Oysterbay, Mikocheni and Regent Estate, and Kurasini where people keep livestock and use gardens around their residences. Unkept school and factory-grounds and road reserves are used for market gardening. These spaces were initially planned as open spaces, but the city council failed to maintain them. They are now informally under UA. Table 1-2 shows overall land use in Dar es Salaam from 1966 through 1992 and urban agriculture features out well.

Table 1-2 Acreage by Land Use Category

Land use Category	1966	1978	1992	% Change 1966-1992
Central area	380	410	440	16
Residential	2,199	6,124	41,100	1,769
Commercial	35	210	320	814
Industry/ warehouse	485	1,370	1,570	223
Institutional	2,049	2,842	3,103	51
Open Spaces	436	12,020	865	98
Agriculture	11,622	17,790	92,172	693
Quarries	-	326	684	110
Forest reserves	-	12,272	20,155	64

Source: Mwamfupe (1994), p. 113.

The data in Table 1-2 includes peri-urban land use. It means that due to urban pressure, the peri-urban zone of Dar es salaam has experienced considerable land-use change. This results from the growth of city population, boundary and city function expansion in demand for both land and food. Land use changes have occurred as more vacant land has been used and certain land uses have been replaced by others. Mwamfupe (1994:122) and Sawio (1993:133-168) found that within the built-up areas, land reserved for recreation is being encroached upon for residential use, including play-grounds.

Increasingly, open spaces around residences in the built-up areas of Dar es Salaam and other towns are coming under cultivation and not infrequently, livestock sheds mushroom in low density and medium density plots. The trend and extent of livestock keeping in cities is yet to be established. Some livestock data for Dar es Salaam show increases in the number of animals reared (Table 1-3). While livestock keeping in the city contributes to the production of meat and milk and also eggs, and contributes to improvement of urban food security, as well as generating incomes and employment, yet keeping large numbers of livestock in urban areas leads to environmental degradation and is a health hazard.

Table 1-3 Some Statistics of Livestock Kept in Dar es Salaam, Mosha (1991)

Type of Livestock	1985	1988	1989
Chicken	510,798	793,441	n.d.
Pigs	8,601	13,383	15,657
Goats	2,617	5,764	6,218
Dairy cattle	4,200	5,718	8,517

Source: Mosha, 1991:84.

In the peri-urban zones, land speculation is causing such agricultural land uses as cashew to be replaced by horticulture and staple food growing such as maize and bananas. This too is taking place in other cities such as Morogoro and Arusha (Stevenson et al., (1994). In general, the peri-urban zone is a region experiencing much agricultural activity. Briggs (1991:11) notes that "the peri-urban zone of Dar es Salaam is currently a zone of considerable dynamism. From a highly neglected area in the 1960s, it became an area of settlement for authorities wishing to rid the city of its economically surplus population during the villagization campaign in the 1970s. In the 1980s, it has become a zone offering opportunities, initially in terms of household survival, and, laterly, in terms of cash income."

3.1.2 UA Growing & Changing in Composition and Practicing Population.

UA is definitely growing and changing in composition as well as the actors involved. Mwamfupe's findings (Table 1-2) shows that acreage under urban agriculture around Dar es Salaam for example has increased considerably in the open spaces and in the peri-urban areas. Interestingly, studies on UA in Tanzania show practitioners cut across a wide spectrum of socio-economic classes, from professionals to casual laborers. Still women are the majority of urban actors, but men and children are also involved. In a National Informal Sector study in 1991, it was revealed that about two thirds of all informal sector operators were involved in agricultural and livestock keeping, including people with formal jobs and some who have been laid off or retired. However, people from every social class engage in

UA activities, but note should be made of the fact that livestock keeping is undertaken largely by the more affluent urbanites.

3.1.3 Contribution to Household Food Consumption

One of the major reasons why households engage in UA is to reduce household food expenditure and therefore production for home consumption is relatively important. In all towns and especially Dar es Salaam, urban agriculture involves many people including the very poor, land less and the more affluent. Some produce for marketing purposes, but the majority for household consumption. On the whole in Dar es Salaam UA contributes about 20 - 30 % of all household food supplies (Sawio, 1993). According to the 1988 Population Census it is estimated that between 6 and 7 % of Dar es salaam workers count on UA as their main source of income (Schippers, 1994). Given the low income rates of 10,000/= minimum p.m, inflation and poor purchasing power of many urban dwellers, it is not surprising that perhaps UA contributes more than 40% to household food needs today, especially production of vegetables: cassava leaves, amaranth, potatoes and their leaves, pumpkins, cow peas.

3.1.4 Marketing of Urban Produce

Urban farmers operate under different sets of conditions and choices. For those who produce for sale, availability of market is an important factor. Not all produce is consumed in the household. In a study of urban horticulture in Dar es Salaam, Dodoma and Arusha for example, it was ascertained that just over half of crops grown were sold. The highest percentage occurred in Dar es Salaam (59%), followed by Arusha (56%) and Dodoma (54%) (Stevenson, 1994:40). For those who sell their urban produced food, incomes thus derived appear to be higher than regular incomes. For livestock keepers in Dar es Salaam, a litre of milk sells for over 300/=; and egg is 60/=; chicken sells for over 1,600/=. The value added for UA produce is rather high.

Marketing of UA products is not a major problem in an area like Dar es Salaam. Among constraints farmers face is the requirement to have a license to operate road stalls and kiosks and lack of appropriate, well furnished markets for perishable products. This and others are among the infrastructural aspects to look at in the promotion of UA.

4.0 CURRENT OFFICIAL ATTITUDES TOWARDS UA.

Official attitudes towards UA in many countries have remained more or less a mixture of repression and tolerance. In Tanzania, the general attitude towards urban agriculture is a positive one, albeit, there is no general policy guideline to regulate the practice of UA. The Ministry of Agriculture and Livestock Development has most its efforts focused on the rural areas and very little, if any, goes to urban farming.

The Master Plans that are in use designated urban agricultural zones, recreational areas and green belts. Hazard lands (mainly flood plains) were designated as agricultural lands as well as land on the urban fringe. For Dar es Salaam this was included in the 1979 Master Plan. However, due to lack of capacity to implement plans and to enforce zoning regulations, valleys have been encroached upon including open spaces earmarked for playgrounds.

There are city by-laws restricting the number of livestock one can keep in the city. By these, residents can only keep four heads of cattle on a zero-grazing basis. While the attitude is not to eliminate urban farming or livestock keeping, the spirit is to maintain a sustainable urban environment and therefore control of UA activities appears to be necessary. Even with such by-laws, to date, there is no capacity within the city council to enforce the by-laws. As a result a number of problems are caused by haphazard open grazing and unguided crop growing. One other area of concern is that urban by laws made under section 80 of the Local Government (Urban Authorities) Act No. 8 of 1982 of Tanzania empower town and municipal authorities to destroy crops grown within the urban areas which are a meter high. When this is done, the urban poor suffer.

Although there is this ambivalence among the authorities, there are hopes, however, following the successful SDP Consultation in 1992 on the Dar es Salaam Environmental Profile that progressively urban agriculture will be given due recognition and be accepted as an integral part of the urban mosaic.

5.0 CONSTRAINTS OF URBAN AGRICULTURE vis-a-vis CITY PLANNING

Indeed, in Dar es Salaam as well as in other towns in Tanzania, urban agriculture is carried out in an environment that could pose several problems which are constraints to the growth of the sector. There is air and water pollution in the major valleys passing through urban centers where UA activities are prevalent. Msimbazi valley is a case in point in Dar es

Salaam. Crops irrigated with polluted water or exposed to polluted air are a health hazard. The same is true if livestock is fed on grass that has been polluted.

Other major constraints to UA development in Dar es Salaam and elsewhere include:

- a. water shortages and insecure land tenure;
- b. scarcity of land particularly for the urban poor;
- c. various kinds of pollution from industrial wastes among which include food processing industrial wastes, textile industrial wastes, metal and paint industrial wastes, pesticide wastes, insecticides and fungicides, and many other solid and liquid wastes from households. These wastes pose as a constraint to urban agriculture development in that it necessitates costs for careful identification and assessment of suitable sites for allocating land for UA. Moreover pollution adds to health problems.
- d. poor capacity to collect waste for dumping and/or recycling to make compost which in turn is returned to agriculture.
- e. the failure of the Dar es Salaam City Council to collect wastes in an environmentally and cost-effective manner has compounded other problems which affect urban agriculture development. For instance, uncollected waste is dumped in drains and sewers causing blockages and flooding, high road and transport maintenance costs and also ground water pollution; this too mars the aesthetics of the urban environment.
- f. Open spaces could be a major source of land for UA in both urban and peri-urban areas. However, due to increase in population and demand for land for housing land use conflicts occur and these militate against UA because the management of open spaces in Dar es Salaam and other towns has failed for lack of resources and perhaps political will among authorities. This is largely due to the fact that among the Ministries, institutional responsibilities as well as accountability are not well defined.
- g. Despite the existence of by-laws that stipulate that in urban areas only four heads of cattle be kept on zero-grazing, in Dar es Salaam and other towns such as Morogoro, large numbers of airy cattle are kept and this kind of urban farming could degenerate into a major environmental and health hazard.
- h. Policy guidelines on Urban agriculture are lacking, and if formulated without the right attitude they may impact negatively on urban agriculture and swing the pendulum of poverty, indebtedness and malnutrition towards the low-income urban dwellers who are at a disadvantage to begin with.
- i. Poor urban farmers seldom benefit from the extension services that are given today because they are absent from the farms during the weekdays and do not have

enough money to purchase some of the more expensive services in relation to livestock keeping.

- j. Since many towns and the city of Dar es Salaam in particular are expanding horizontally versus vertical expansion, and this a constraint in that it results in land speculation in the peri-urban areas and hence diminution of potentially good land for agricultural development.
- k. Other constraints related to lack of credit facilities for the low-income urban farmers, inability to avert post harvest losses, lack of knowledge to embark on such simple technologies as community composting, container farming, ridging, nursery planting and others that interest even children and the elderly.

6.0 CONCLUDING REMARKS

The prevalence and significance of urban agriculture as well as the challenges it poses to urban planners, decision-makers and residents themselves is now widely recognized. This is attested to by the growing research on Ua that is coming up now. This, however, is gaining momentum in view of sustainable development of human settlements.

The notion of building in balance with nature as echoed in the ecocity conference in California underscores the importance of urban agriculture. Equally important is the fact that cities need not continue to be receivers of resources from outside and generators of pollutants. To render cities more productive and economically as well as environmentally more appealing, promotion of urban agriculture sounds but a welcome proposition.

Because urban agriculture is relatively a new phenomenon in the urban or city planning tradition, and though some notions of illegality or "ruralization of towns" appear to be negative attitudes, in Tanzania, particularly Dar es Salaam, under the Sustainable Dar es Salaam Project, more positive aspects of urban farming are increasingly being recognized and no doubt more research as well as applied demonstration projects which show UA to be a workable management regarding urban environmental issues are more needed today than before, especially where such other issues as gender, nutrition, livelihood enhancement, pollution abatement, potable water provisions and the like must be tackled realistically in order to alleviate urban poverty.

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**Une Histoire des Deux Villes:
Comparing Canadian Community Gardening Programs in
Montreal and Toronto**

Introduction

The production of food in urban areas, at first glance, might seem out of place. Yet cities have always produced some of their own food and, in emergencies, quite a lot of it. Today, horticulture is a major recreational activity in cities. In contrast to fairly steady support in northern Europe, urban community gardening has seen "waves" of popularity and applicability in North America.

Toronto very partially caught the last upswell in the early 1970's, whereas Montreal and many U.S. cities have developed sophisticated programs, with or without municipal government support, since then. Toronto and Montreal have vigorous inner city neighbourhoods and few vacant lots in which to site neighbourhood community gardens in comparison to Eastern U.S.A. cities.

Toronto, the largest city in Canada, with 2.5 million people in it's Metropolitan area and 4 million in its region, lacks a cohesive, comprehensive community gardening consciousness. By contrast, the Island of Montreal, with a population of 2 million, has one of the best community gardening programs in North America.

MONTREAL:

Community Gardening Profile

Montreal began its community gardening program in the post-Opec 1973 period, like most new wave community greening programs. Montreal has a very extensive, well-organized and supported community gardening program. Metro Montreal and has 15 municipalities. There are over 100 community gardens on the island. The City of Montreal maintains the most by far, and has some 75 garden sites, in many sizes, containing 6654 allotment plots. The largest garden site has 255 plots. I am going to speak mostly about the City of Montreal program.

Their program is run by the Department of Recreation, Parks and Community Development. Soil, manure, fencing, water, tools, toilets clubhouse\toolsheds and on-going maintenance are provided by the City. In addition, there are 5 paid horticultural animators who are responsible for a group of sites. These resource people answer any horticultural inquiries, work with the executive of each garden group, and report on any maintenance problems. Maintenance is then provided by the Public Works Department.

History

In the early 1970's Italian and Portuguese immigrants in North Montreal district were guerrilla gardening. Noticing this, The City tried to regulate the activity, and these regulations began to formalize a process to permit and organize community gardens. The City soon found itself stuck in a competition of neighbourhoods and groups to get land for gardens. The community gardens then found a political champion at the Montreal Botanical Garden, Pierre Borque, who sheltered the fledging program under his wing. There was great expansion until the program grew so large that administration was bogging down. A complete review of the program by the City of Montreal took place in 1985, the year of the departure of Montreal's long serving boss-mayor, Jean Drapeau.

This review was very significant and resulted in the establishment of clear policies for the establishment and operations of the gardens. The review mandated that all gardens use organic methods. It created the role of horticultural animator to help ensure a transition to organic gardening.

The Department of Recreation and Community Development was given over-all responsibility for the program. They co-ordinate several other Departments who work on different facets of the program. These include: Habitation & Urban Development; Provisioning & Buildings; Public Works; and Planning & Policy.

Current Situation

The community gardening program is especially popular with senior gardeners, age 55 and over. They are the majority in 39 gardens (and in 2/3 of the largest gardens). There is a multi-cultural presence in many gardens, and eight gardens have a majority of neither "anglo" or "franco" citizens.

The gardens are very productive and have a long waiting list. Inscriptions cost \$5.00 per year and solicitations are sent out in the monthly hydro bill. The City could site 12 new gardens on the basis of their waiting list of 25%.

Every gardener must agree to the rules of the garden program, such as the insurance stipulation. Insurance is provided in the City program. Gardens are grouped in lots of 10 or 15 for insurance purposes. There is some flexibility in respect to how each garden is organized. Gardeners must grow, however, at least five different types of vegetables. They are now being allowed to grow flowers in the common areas along the fenced borders.

Many of the sites are on institutional land. Montreal relocated 12 gardens 1986-89, at a capital cost of \$400,000.00. They estimate costs of \$20,000 in the establishment of a new garden site of 90 plots. There is official community gardening zoning for 13 garden sites. 22 gardens are situated in City parks. This is by far the largest, best organized program in Canada, owing, no doubt, to their community development goals and objectives. They are planning strategically to improve the program.

Key Challenges in the 90's:

In the 90's the program has conducted composting experiments in one-third of the gardens, is donating food to community kitchens, and ensuring better access for disabled gardeners. It has also suffered funding cuts and has lost half of its important horticultural animators.

Other issues that the program faces is challenges to the permanence of garden sites. It is still a challenge finding land for new gardens, the expansion of existing ones and the replacement of gardens that have been lost to development. Also needing to be resolved is inter-departmental confusion about the availability of resources and each department's working role.

Future

The former coordinator of the Botanical Garden, Pierre Borque, the Green Giant, has resigned to run for Mayor in the fall of 1994. His victory could mean more resources for the community gardens and he has called for more horticultural therapy projects in the City.

METROPOLITAN TORONTO:

Community Gardening Profile

Toronto had " Victory" gardens in both wars. As in other places after the OPEC oil shock of 1973 urban land use needs for horticulture were re-evaluated and garden spaces were established mainly on hydro rights of way in the suburbs.

Toronto's High Park allotment garden dates from this period. It is one of only 3 City of Toronto allotment gardens administered by the Department of Parks and Recreation. There are 375 allotment plots in the three sites.

In Metro Toronto, the community gardening programs are mostly run by the municipalities' departments of Parks and Recreation as allotment gardens under centralized control (no gardener's clubs). These are generally sited in regional open space and often access is mainly by automobile. In total, Metro has 15 community allotment sites with 2000 available allotment plots. Please refer to the appendix for specific information on these programs.

In addition to these regional allotments, in the mid 1980's the Food Action Project of Foodshare Metro Toronto aided approximately 15 community gardening projects, mostly sponsored by social housing agencies such as Metro Toronto Housing Authority and increasingly by Community Health Centres.

GROW T.O. Gether Community Gardeners has identified another 15 or so small community gardening projects that could classify as neighbourhood community gardens. These are usually tucked away in left over space, some of which are rooftop or terrace gardens.

Healthy Cities

Toronto has shown leadership in urban environment through such documents as the Healthy Toronto 2000 Strategy which commits the city to creating and maintaining social and physical environments supportive of health. The idea of Healthy Cities involves an holistic planning approach, meaning that "it is no longer possible, to compartmentalize neatly the city's problems into parks, police, engineering, public health, urban planning, and other relatively narrowly defined specialities" (Hancock, T. in Ashton, J. ed.

Healthy Cities, Open University Press, London 1992.

In the Healthy Toronto 2000 Strategy, explicit encouragement is given to the Food Policy Council to investigate the potential of urban food production. The Food Policy Council adopted this as a priority. The Healthy City Office was mandated by Council in 1989 to address the need for a Community Development Policy for the Corporation. In 1991 these City agencies called together an interdepartmental technical working group, to investigate City supports to community gardening.

At the same time they helped a community coalition and urban gardening resource group, later called Grow T.O. gether Community Gardeners (GROW T.O.), to organize. The two groups, the technical working group and GROW T.O., never were in enough contact to ensure good cooperation and both worked in an environment of Toronto's severest recession since the 1930's. This reality resulted in a rough birth and infancy for GROW T.O. with very little government or private grants to GROW TO. It also meant that early plans to propose new program monies from the City were quickly shelved in an atmosphere of cutbacks and downsizing.

Nevertheless, the interdepartmental group produced a report with 18 recommendations, the Garden City Report, that was passed by City Council in December 1993. GROW T.O organized groups and individuals to comment on the report and helped to modify it. GROW

T.O are also involved as volunteers in helping assess the pilot phase of the report. The idea of the Garden City report is to align the existing and remaining parts of the different Departmental budgets, in cooperation with other partners, to help local groups establish community gardens. The Department of Parks and Recreation is the acting lead agent. If approached by a group with no site, they will refer them to the City Property Department. If a site is found, the Public Health Dept. can help with soil tests. If the tests are good, the Public Works Dept. can advise on garden design and implementation. Metro Works can advise on composting, and so on.

GROW T.O. has obtained permission to plan a new garden in City parkland, a very encouraging sign. Several other groups would like to participate in the project, but the groups have to do the development work themselves. There is hope that the Dept. of Public Health's Community health officers can animate some of the groups.

The Toronto Situation in 1994

GROW TO has produced the first useable map/inventory of community gardens in Toronto, has conducted garden tours by bike, has a newsletter, participates in public events, organizes seed and seedling donations and is in the process of moving it's demonstration site to a beautiful new area. 5 new gardens were catalogued in 1994.

The Food Action Project, serving low-income citizens, closed in July, 1993 and GROW T.O. Gether Community Gardeners is trying to pick up some slack but has almost no resources to do so.

A Rooftop Gardens Resource Group, consisting mostly of design professionals, has been meeting for almost two years now, and has as it's mission to change the general culture of Toronto to become conscience of the need for off-grade greenery. Because of the lack of vacant lots in Toronto, this group could play a key future role in the development of more gardens.

A School Gardens and Composting Committee has been meeting for two years and has evolved into a group that educates parents and teachers on the benefits of gardening and composting by hosting seminars. We have conducted five successful seminars so far. More schools are attempting to green their school yards and incorporate these lessons into their curriculum, but there is a long way to go.

Metro Toronto is well respected for its commitment to community composting. More than 25 housing complexes (the largest with 500 occupants) have installed triple bin compost systems. These are mainly housing co-operatives that want the compost for their own landscapes. As a new initiative, community composting needs more experimentation and evaluation. The Recycling Council of Ontario was training Master Composter's to help in this area, but no longer does so.

Future

The key to the establishment of a vigorous community gardening culture in Toronto has not yet been found. Why Toronto's activist neighbourhood groups did not turn to community gardening as a community development tool in the 1970's probably had to do with lack of vacant lots, as opposed to the land availability situation in Eastern U.S. cities. In Montreal, progressive city bureaucrats discovered that they had a storm of citizen support and participation in a popular recreational activity. This has not been discovered in Toronto, although the City of Etobicoke comes close (see Appendix 1).

If Healthy City principles can take place in practice in Toronto, and if this means that citizens and government can be effective partners, then community gardening may spread as a valued activity and land use in Toronto.

Appendix 1

The total area with allotment gardens in the Metropolitan Toronto is about 62,180m² or 6.2 ha (see Table 3). The City of Etobicoke has the largest area with 22,500m² or 2.25 ha, representing 36.2% of the garden area in Metropolitan Toronto and the Borough of East York has the smallest area of 3,136m² or 0.3 ha, representing 5.0% of the total area.

Table: Summary of Allotments Gardens on Metropolitan Toronto.

	Numbers of Plots (N) and Total Area (A)	Rent Price (year)	Characteristics
Borough of East York	N: 98 (8m X 4m) A: 3,136m ²	\$10.00	no security system; no information about waiting list.
City of Etobicoke	N: 500 (6m X 7.5m) A: 22,500m ²	\$40.00	no security system; no waiting list.
City of North York	N: 245 (6m X 7.5m) A: 11,025m ²	\$25.00	security fences; waiting list: 30 persons.
City of Scarborough	N: 400 (3m X 6m) A: 7,200m ²	\$13.00	security fences; composting provide; waiting list: 10 persons.
City of Toronto	N: 225 (3m X 6m) A: 4,050m ² N: 109 (6m X 9m) A: 5,886 m ² N: 24 (6m X 9m) A: 1,296m ²	\$10.00 \$20.00 \$20.00	security fences; waiting list: 80 persons.
City of York	N: 126 (7.5m X 7.5m) A: 7,087.5m ²	\$35.00	composting provide; security fences; light at night; waiting list: 5 persons.
Total Area for M.T.	N: 1,727 plots A: 62,180m ²		

Source: Eguillor, P. Urban Food Production: A Seed For Sustainable Cities?
Master's thesis in Planning, University of Toronto, 1993.

Timothy Greenhow, Swedeplan, Stockholm, Sweden.

Presentation to Habitat 94 in Edmonton, September 20, 1994

Urban Agriculture: Can Planners Make a Difference?

Introduction

Agriculture in one form or another is a fairly common feature in urban areas around the world. It fills a variety of roles, being a basic element of survival in some cities, and an important form of recreation in others. It is surprising therefore that it receives so little deliberate attention by urban planners, sociologists and economists. In this paper, three very different situations are described that show the range of attitudes towards urban agriculture by planners in three countries: Lesotho and Botswana in southern Africa, and Sweden in northern Europe. A basic issue is addressed: in the three cases, has planning had a significant role in influencing the extent to which agriculture is represented in urban areas?

The wider context, of course, is that of the possibility of creating more sustainable cities. Much literature on this subject focuses on the problems of energy and traffic, rather than on the basic ability of urban places to feed themselves or deal with wastes. The role of planning, as used in this paper, encompasses the functions of physical design, to some degree even of buildings through building regulations, of zoning and development control, and of enforcement of planning decisions. The planner here should take cognisance of economic, social, and environmental factors.

Lesotho

Lesotho is a mountainous kingdom surrounded by South Africa, with a very narrowly based, and decidedly poor economy. Maseru, the capital, lies at about 1500 m above sea level and enjoys a temperate climate. The town had approximately 110,000 inhabitants in 1986, and has the special feature of having maintained its traditional communal land tenure.

Physical planning is carried out by the Physical Planning Division in the Department of Lands, Surveys and Physical Planning. Until the mid-eighties the general approach to urban planning was one of strict zoning. In residential areas, for example, only residential uses were to be permitted. This would allow for the compression of plot sizes to achieve high densities and low per plot infrastructural costs. Rural activities, particularly the keeping of animals, were viewed as inappropriate in a modern urban setting. Horticulture might be tolerated, but was certainly not given any place in planners' concepts of land use or integrated urban functions.

Development control and enforcement in the mid-eighties was weak, and even the allocation and administration of land was *de facto* uncontrolled by State authorities. Physical planning was not able to keep abreast, and certainly not ahead, of the demand for serviced land. Maseru was experiencing a period of rapid population growth and physical expansion.

In 1986-89 The Division carried out a Master Planning exercise with the support of a team of Swedish planners. Among other sectoral investigations, a special study of agriculture within the town was undertaken as part of the master planning process (2). Given the prevailing attitude to "urban character" this was in itself a departure from the norm.

The findings were not expected:

- 55% of all plots surveyed (4280 in total) had some form of agricultural activity on-going.
- where soils are decent, low income and self-help housing areas have high frequency of horticulture (over 80% of households with some form of agriculture). Low income areas on rocky soils have relatively more livestock production - pigs and poultry.
- a surprising number of medium and high income residential plots engage in agriculture with dairy farming and poultry fairly common.

A more detailed survey of 10% of plots was made in which people were asked why they engaged in agriculture on their residential plots.

- Saving money and making money were the two most frequent answers to reasons for keeping livestock. Two thirds of high cost area households claimed to sell produce regularly; 29% of households in site and service low cost areas.
- even with vegetable gardening saving money was most important. Sixty nine per cent of low income households try to save money through growing vegetables at home, 51 % of medium and 32% high income households do likewise.
- when asked what they considered the greatest constraints to increasing crop

production most medium (60%) and high (64%) income households felt that they had sufficient production, while fewer than half in lower income groups felt that way. They claimed limited space was the principle factor, with other reasons including inadequate security, water problems and natural constraints as presenting the greatest hindrance to increased production. Only in medium and high cost areas were labour problems considered a constraint.

Apart from home based agriculture, Maseru has a considerable commercial agricultural sector. The following statistics refer to activities that occur within the city limits.

- In the mid-eighties seven major egg producers owned between them 75,000 birds, and the marketing agency (The Egg Circle) had a monthly throughput of 90,000 dozen eggs.
- There were at that time over thirty large scale poultry producers, with one broiler unit having a capacity of 25,000 chickens and a slaughter unit capacity of 2,500 birds a day. This sector was still expanding at the time.
- The national pig-breeding herd lies within the town, and had the capacity of producing 2500 weaners per year.
- The dairy, estimated to cater to about 40% of the town's milk production, processed 3000 liters of milk a day, from 94 urban producers.

Based on this and other studies done at about the same time (4), it was conservatively estimated that urban agriculture exceeded nine million Maluti per year (The Loti was equivalent to the South African Rand). This is estimated to be several times the level achieved when the same area was still rural agricultural land under semi-traditional management.

It was fairly clear from the study that provision of water through a modern reticulation system and at minimal (in some cases subsidized) cost had much to do with the widespread gardening.

An interesting result of the planning exercise was the change in attitude of the planning cadre to single use zoning, and the willingness to accept the residential plot as a productive land unit. There remain serious reservations about livestock in the city, and a recognition that this sector must be controlled for health reasons.

Maseru illustrates the case in which there has been an economic pressure in support of urban

agriculture, plus an opportunity (in the form of reticulated water, reasonable soils, and lack of livestock and other development controls). Up to the mid-eighties, it is doubtful that the planners could do much to stop urban agriculture even if they wanted to.

The main threat to continued intensive horticulture has in fact been the World Bank, whose emissaries have pressed for smaller plots for low income households on the grounds of cost efficiency. This is in turn based on a zoning concept that treats residential land as non-productive sleeping quarters, rather than potentially productive land units. This approach has been supported by certain international planning groups who have similar attitudes to urban form and function.

Botswana

Botswana has a different agricultural tradition from Lesotho. The climate is drier and hotter, the soil generally not fertile. The growing environment is not naturally kind to horticulture. Water is scarcer and more expensive, although in major rural settlements water at public tap stands is provided free of charge.

Planning is undertaken by the Department of Town and Regional Planning. Gaborone, the capital, was planned and established just prior to Independence by British consultants. It is located on State Land, but adjacent to two areas of traditional tenure. The Planning Department views modern urban areas as very different in form and function from the large traditional towns that exist in Botswana. For example, agriculture is seen as clearly inappropriate in modern urban centers and is given no acknowledgement in zoning or land development control. No provision is made for horticultural allotments, although some private attempts have been made to develop small gardening plots. The Ministry of Health encourages horticulture on a national basis and the Prison service is known for its vegetable production and horticultural training of inmates.

Development control and enforcement is much more effective in Gaborone than in Maseru. Plans have tended to keep ahead of demand, at the price fixed for state land leases. Demand beyond this has been met through the acquisition of land in communal (tribal) land outside the city. Squatter settlements that grew up in the 1960s and early 1970s were upgraded, and strict measures adopted to prevent expansion.

Although many households in Gaborone (Botswana's capital) try to maintain kitchen gardens, even using waste water, the practice is neither so prevalent nor so successful as in Maseru. There is general dislike of any vegetative cover by householders in Gaborone and Botswana generally. Shade trees are tolerated in residential plots, but most often all grass is carefully removed to reveal bare sand. This is done, so it is said, to hinder mosquitos and snakes from approaching close to the house. The effects on the micro climate are entirely negative.

Botswana's dry climate and Gaborone's rapid growth has meant that water shortages have occurred several times in the city's history. The first step in reducing water consumption has always been to forbid watering of gardens (and lawns) except with grey water. At the same time, the building code does not encourage the use of water-saving toilets, nor do planners or builders encouraged the use of rainwater catchment tanks.

The income gap in Botswana has been increasing in recent years, and poverty is more widespread and open than previously. But the impression given in the country has been that the economic necessity to practice horticulture on urban residential plots has not been great enough to overcome the lack of skills or experience, or other cultural and financial costs inherent in adopting this survival strategy.

Other than dogs and cats, only poultry is permitted. Other livestock is prohibited for veterinary reasons. Botswana has a fairly effective means of livestock impoundment. There have been unsuccessful attempts to ban chickens on the grounds that chickens are noisy, but poultry owners rejoin that the numerous dogs are a much greater noise problem and they do not provide eggs or meat to their owners as poultry does. In years of serious drought, a limited number of cattle are allowed into the city to graze road margins.

The conclusion one can draw in Botswana is that the impact of planning authorities on urban agriculture is at most one of neglect and antipathy. It is not the planning authority that enforces the prohibition of livestock; nor has it been planning decisions that have led to the low level of horticulture in the city. At the same time, the planning authorities have not provided the physical context in which urban horticulture could be aggressively supported.

More recently, the problems of sewage disposal have made large scale extensive agriculture (fodder and fuel wood production) based on waste water more attractive. However, these activities are still conceived as taking place outside the city.

Sweden

Swedish planning is the responsibility of the municipal level of Government, where responsibilities for primary health and education, waste management, and recreation also lie. Swedish municipalities are furthermore significant land owners, and have developed special methods of land development by negotiation with private developers. Control is effective, and the population basically compliant, partially because there is adequate means for participation in municipal decision-making.

Urban agriculture takes a number of forms in Sweden. It is not likely that these forms differ greatly from those found in other European countries. For many years, little attention was given to this activity by authorities. In the past 10-15 years, with greater attention being given to sustainable life-styles, recycling of waste and especially composting of kitchen wastes, urban agriculture has received the blessing of local authorities and the national parliament.

The kitchen garden, located on the residential plot is common. Berry bushes and fruit trees are popular as are table vegetables. In virtually no case is this type of home gardening an economic necessity today, but is a reflection of interest, a hobby, a source of home made preserves, juices, and even wine.

In the late 1800s a new movement came to Sweden from the continent. This movement led to the development of garden allotments. In the first world war in Stockholm, workers at a sugar mill began to grow vegetables on vacant city land. This illegal activity was tolerated in view of the circumstances. After the war the city council laid out allotments in several stages, in the area, as the gardening associations became organized and pressed for additional land.

Poverty and necessity were driving forces in the beginning of this movement. This led later to a period in which allotment farming became stigmatized. Having an allotment indicated poverty, so the movement experienced a down turn in popularity. However, it never died out, and by the 1960s and 1970s had regained its popularity. There is continued pressure for new allotments, with applicants for lots in existing areas waiting as long as eight years for a lot. Today the Swedish Association of Allotment and Leisure Gardens has 30,000 members in over 300 local chapters spread among virtually every municipality in the country. It produces a regular journal, provides advice in the form of pamphlets and even telephone

support on a wide range of relevant topics, and produces training materials.

In Stockholm City there are currently 75 allotment and leisure garden areas, with about 7,500 lots (7). There are generally two types of area: those where small cabins may be built, having an area of 300-400 m² and those that are smaller - 150 m² - where no shed or cabin is permitted. Until the 1970s allotments were frequently closed to make room for the expanding city. In the mid-1970 Stockholm politicians decided that these areas should be recognized as legitimate uses in city planning, that space should be reserved on city land for future allotment gardens, that leases should be of fairly long duration, and that the economics surrounding this land use would be studied. Most of these decisions have been carried out.

In most cases the land is owned by the city, and leased to gardeners for 25 years. Gardeners must be members of the Association. The City negotiated with the Association on rentals and in 1985 set the price at 0:50 SEK/m² for leisure gardens (without cabins) and 1:60/m² for allotments where cabins are permitted. The fee increases each year at a rate of 60% of the consumers price index increase.¹

The Association arranges for general upkeep of the area, and for maintenance of any buildings provided, such as ablution blocks. In areas where cabins are permitted, they can be lived in between 1st April and 30 September and otherwise over weekends. Thus, there can be additional costs in infrastructure (water, lighting, refuse collection, public telephone, or rain shelters.). Apart from the land rental fees, gardeners must pay service fees of between 400-800 SEK/yr in areas with cabins, or 200-300 SEK/yr for other areas.

There are other institutions also active in the field. There are at least 20,000 members in other leisure gardening associations around the country, and many more households that are not members in any formal association. The 4H clubs support children's training and encourages their interest in gardening, municipal councils are increasingly supportive of small scale agriculture, and in many cases provide land for allotments.

From the 1970s onward there has been a parallel growth in environmental awareness and an interest in planning with special regard to resource management. The referendum to end

¹ At the time of writing (August 1994) the exchange rate is approximately 12 SEK = £ 1 Sterling and SEK7.60 = US\$1.

the use of nuclear power was perhaps the most widely publicized act in this movement, but since then issues of urban energy use (especially in the form of private vehicles, but also in housing designs), waste management and control of greenhouse gas emissions have been significant components. This movement has grown steadily, and it now a strong force for the recycling society - the sustainable community. Sorting of wastes is an obvious part of the recycling philosophy, and it has been pursued vigorously in spite of questions about its economic justification. Sorting of kitchen wastes and composting of organic components are currently key elements.

Many housing developers are now building into their layouts and building designs provision for composting, and kitchen gardening in proximity to housing projects. In some cases this includes greenhouses built into apartment buildings' southern facades (5). Redevelopment is also being undertaken in some large scale housing schemes from the 1960s, with composting facilities and location of space for gardening being provided.

To date little has been done in the area of animal and poultry rearing in urban areas. There are only a few municipalities that have the competence to evaluate and advise on proposals or set reasonable controls within built-up areas. However, some councils have leased public land within built-up areas to farmers to provide demonstration farms, which school classes and the general public are encouraged to visit. These farms generally incorporate some animal husbandry. Otherwise, many municipalities actually discourage or forbid the keeping of animals other than the usual pets, in residential areas. At the same time, in many urban areas, wildlife, such as deer and hares, represent a major pest to gardeners.

In summary, Swedish planners are now taking an active part in encouraging urban agriculture, through the provision of land, and the recognition of the sector as a useful component of the urban landscape. The close integration of planning with other sectors in municipal affairs (health, education, waste management, building control) also allows for an integrated approach that gives agriculture a recognized place.

Comparative Comments

The three cases presented in this paper represent to some degree three types of city, as well as three planning situations. Maseru represents the city (or parts thereof) whose inhabitants farm out of necessity, and in which the preconditions are suitable. The planning system is not particularly strong, especially with regards to enforcement, but nor is it entirely opposed

to the horticultural components of urban agriculture.

Gaborone represents those situations where planning control is effective and other regulations are enforced, and where neither the preconditions, nor the planning attitude are conducive to widespread urban agriculture. The subsistence need (at present) is not as great either, or it is displaced to those surrounding communities where the poor are more able to obtain free land and live on a minimal level.

The Swedish example is more illustrative of those situations where planners are beginning to recognize the value of urban agriculture to the extent of making regular provision for it in housing designs, zoning and development regulations, and encouraging it through specific financial incentives. In a growing number of Swedish municipalities, it is not seen as an activity on its own, but as a valuable component in a new approach to planning with the environment and the sustainable city in mind. Still there is much to do. Other components include alternatives to water-borne sewage, or use of wetlands for water purification.

A number of specific comparisons between the three countries presented above make these generalizations very clear:

- Urban agriculture in Maseru is a sector with major economic significance, both at the household and at the commercial scale level. At household level it is an important part of the survival strategy for low income families, a clearly attractive additional source of income for middle and high income earners. In Botswana, urban agriculture is not a significant contributor to the urban economy. Urbanites have retained links to rural land holdings which may serve similar purposes. In Sweden, the economic dimension is more variable, but the role of agriculture as a hobby and recreation is recognized as having significant health (therapeutic) value especially for the elderly (10). As part of the waste management process, kitchen gardening is theoretically able to halve the solid refuse collection costs from residential areas².
- In all three cases urban physical planners have traditionally tended to view urban agriculture with little more than tolerance, certainly not as an activity to encourage or promote. This has changed in the 1980s in Lesotho. The change has not occurred in Botswana, while in Sweden, a change that began in the 1970s has become a

² In many municipalities households that obtain and commit themselves to use an approved composter, have their refuse bill reduced by 50% and refuse collected half as often. There is therefore an economic incentive for households to compost.

component in the larger, and increasingly important, trend to more ecologically sound physical planning. Municipalities can commit themselves to ecological principles in planning and management, and become eligible for State aid to this end ³.

- Agricultural extension services in Lesotho and Botswana are not organized for coverage of urban centers. The Ministries of Agriculture do not formally acknowledge that there is a thriving agricultural sector in their cities. There is no organization of urban agriculturalists to promote the art and science of intensive small scale horticulture, nor to represent and promote their interests vis á vis the authorities in either Lesotho or Botswana. By contrast there are large, sophisticated, and active organizations in Sweden, through whom negotiations and contact with authorities are continuously undertaken.
- There is no literature available to home gardeners, nor specialized seed suppliers in Lesotho and Botswana. Little competent advice is available on the use of agricultural chemicals or on composting, for example. The mis-use of agricultural chemicals in intensive agriculture in medium to high density residential areas has considerable risk to public health, as does the mismanagement of livestock. By contrast there is a wide assortment of material available in Sweden, and organic farming is actively encouraged. Most allotment associations actually forbid the use of insecticides and herbicides.
- World Bank-financed urban infrastructure projects in Lesotho and Botswana consistently press for reduced sizes of plots on the grounds of cost, without assessing the potential for cost recovery through intensive kitchen gardening, nor its other cost saving impacts in reduced runoff, reduced waste collection and management costs, nor its less tangible benefits to micro-climate and nutrition, and aesthetics.

Conclusions and Recommendations

We would conclude that planners do have a role to play, primarily through contributing to the preconditions for urban agriculture. This contribution alone, however, is not sufficient to see a thriving urban agricultural sector - there are other factors and actors. On the other hand, refusal to make planning provision for agriculture in circumstances where there is a felt need for it, will most likely lead to the citizenry adopting approaches that circumvent planning and other control systems. The institutional context within which planners operate

³ See for example **Eko Bulletin**, an information bulletin published jointly by the Swedish National Board of Housing, Building and Planning and the Ministry of Rural Development.

will make their contribution more, or less, effective.

In view of the nature of this Conference, a number of actions and objectives are recommended. These include actions directed at urban agriculturalists themselves, at local and national planners and other government authorities, and at international financial institutions and donor agencies.

- Mobilize the well organized urban agricultural organizations in Europe and North America to take a more active part in third world development by:
 - lobbying their respective national donor agencies to become involved in this field;
 - themselves building links with non-government organizations in developing countries and offering institutional advice and support.
- Seize the initiative and build on the momentum created by Agenda 21 to publicize the environmental and economic values of urban agriculture. It has special relevance in the current vogue being generated around "sustainable cities." Planners have a key role in this initiative.
- Major international financial institutions (eg World Bank, Asian, Inter-American, European, African, Arab, Caribbean Development Banks and IBRD) must be urged to give room for agriculture in their support to urban development programs, particularly where these programs are aimed at the urban poor. A specific area of concern here is in altering the perception of such banks towards residential areas from tightly packed bedrooms to potentially productive land units given adequate size and institutional support.
- Professional town planning societies and associations should take note of the potential of urban agriculture and ensure that it is taken seriously in the practice of physical planning, and in professional training in this field. Encourage HABITAT to stimulate attention in this field. Of specific planning interest are:
 - adjusting legislation (especially, but not only, planning legislation) to be more favourable to controlled urban agriculture;
 - the explicit incorporation of household kitchen/organic waste management features (kitchen design, plot layout, development control codes) for both single and multi-family dwellings;
 - zoning and permissible land uses;
 - provision of land for allotments;
 - incorporation of gardening areas close to school and nursery sites, if not included within them;

- explicit incorporation of household urban agriculture in green area and recreation land uses.
- Agricultural Ministries should develop appropriate extension services to urban agriculturalists, whether hobbyists or semi-subsistence households. Alternatively, this is a field that could be developed by NGOs, special interest groups, or even suppliers of horticultural requisites. Horticulture within the urban sector should be encouraged in nursery and primary schools.
- Encourage and promote applied research in the field of urban agriculture. There are potential hazards in uncontrolled urban gardening - plants do recycle toxic chemicals from the soil, unscrupulous use of chemical can be dangerous, and intensive livestock production has additional health implications, so the approach must be balanced. But the fear of something going wrong should not be allowed to stifle support before it gets underway.

Urban agriculturalists are a creative and ingenious group of people. With or without the support of planners and other institutions, they will continue to garden, either out of necessity or out of the sheer joy of it. It would be better to recognize, support, and direct their contributions to sustainable communities, than to pretend they are not there, or worse, to deliberately undermine them.

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Biography

Tim Greenhow

Born and raised in what is now Zaïre, Tim received his basic education in Zambia, before moving to Ontario, where he attended the University of Windsor. There he studied geography, then specialized in urban and regional planning. His Master's thesis was on natural resource management.

Since graduation Tim has worked in a number of developing countries, including Botswana and Papua New Guinea. Responsibilities were primarily within land use planning and natural resource management, and generally within the context of integrated development planning.

In the mid-eighties, he was invited by the Swedish International Development Authority to manage a project to establish a national land use planning institute in Lesotho, where he pioneered efforts to increase local participation and direct involvement by community members in resource management. In these efforts he, for example, introduced drama and popular theatre as media for communicating issues and prompting local solutions.

Following this work he was invited to return to Botswana to work on a programme for planning the Okavango Delta Region and for planning the Greater Gaborone Region - two projects that stressed the importance of sustainable resource utilization in development work.

For the past five years, he has been based in Stockholm, working for Swedepplan, the International Division of the Swedish National Board of Housing, Building and Planning. In this capacity he has participated in projects around the world as varied as soil conservation in the high Andes of Ecuador, introduction of GIS to Thailand's Office of the National Environment Board, and the development of a Baltic Basin Vision for the year 2010. Currently he is working on a design and feasibility study for integrated shorezone management in Guyana...

...where he can stand on his balcony and observe urban agriculture taking place across the road on an old disused railway reserve! His own interest in urban agriculture stems partly from his childhood experience depending on his family's kitchen garden during the war in Congo, to experiencing the worst effects of living beside an urban dairy farmer (and government minister) in Lesotho, to frustrating attempts to grow vegetables where ever he has lived - including Sweden. He has developed a strong respect for those urban households who manage to depend on, if not love, their home gardens.