

Development of urban and peri-urban agriculture in West Africa *Développement de l'agriculture urbaine et périurbaine en Afrique de l'ouest*

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Abstract

Urban agriculture is an important source of income and nutrition for urban populations. Horticulture, mainly vegetable production, has expanded in and around West African cities as an informal activity practised by poor and landless city dwellers. The broad diversity of crop species allows year-round production, employment and income. Growers have realised that intensive horticulture can be practised on small plots, using water and land resources efficiently. Urban and peri-urban agriculture has a potential to provide productive jobs for the urban unemployed, while contributing significantly to the food provision of Africa's cities. In Accra an estimated 3 percent of the labour force is engaged in urban farming and urban farmers supply 90 percent of vegetable supplies. Urban agriculture is developed in areas that generally have a precarious status and whose development or distribution may depend on the unilateral ideas of municipal authorities or specific urban management institutions. Land under the authority of these institutions is used without formal authority but with varying tolerance, not always backed by rationality. Despite success and growing importance, peri-urban irrigation is still subject to numerous constraints, including insufficient access to clean water, uncertainty about land tenure, inadequate know-how, increasing pressure and marketing difficulties.

Résumé

L'agriculture urbaine est une importante source de revenu et de la nutrition pour les populations urbaines. La production des fruits et légumes s'est répandue autour des villes ouest-africaines. Il s'agit d'une activité informelle pratiquée par les citoyens pauvres et sans terres. La production d'une gamme de cultures très variées offre aux exploitants l'emploi et des revenus tout au long de l'année. Le maraîchage se pratique de manière intensive sur des petites parcelles mais avec une efficiente utilisation des ressources en eau et en terre. L'agriculture urbaine et périurbaine offre une possible réponse au problème de chômage urbain tout en contribuant à la sécurité alimentaire des villes africaines. A Accra on estime que ce secteur occupe environ 3 pourcent de la main d'œuvre et fournit 90 pourcent des légumes. Mais l'agriculture urbaine et périurbaine se développe dans des zones dont l'attribution et la mise en valeur dépendent des décisions unilatérales des autorités locales. Les terres sous leur contrôle sont exploitées sans autorisation formelle avec plus ou moins de tolérance. Malgré sa réussite agrandissante, l'agriculture périurbaine est toujours soumise à de nombreuses contraintes : incertain accès à l'eau, insécurité foncière, connaissances limitées, et difficultés d'écoulement des produits.

1. Introduction

Africa, which has for a long time been the least urbanised region in the world, is now undergoing an urban explosion. In the West African humid forest zone more people live in cities than rural areas. In approximately 20 years, two out of three West Africans will live in urban centres. This represents an immense challenge for food security, sanitation and poverty alleviation especially as the per capita food supply is still decreasing and the number of undernourished people living in cities is on the rise. Natural demographic growth and population migration are the sources of this poorly organised urban growth, which entails economic, social and environmental problems.

The 1980s have been referred to repeatedly as a decade of crisis for African development. None of the factors underlying this "crisis" are new: declining terms of trade, declining per capita production of food crops, increasing foreign indebtedness, environmental degradation and continued high rates of migration by the young from rural to urban areas. Two major catastrophic droughts through much of sub-Saharan Africa, combined with conflicts and political turmoil during the decade, have led to the decline of much of the formal, modern sector of Africa's economy, with a resulting decline in the standard of living for both urban and rural people.

In apparent reaction to the increasing urban population, intensive peri-urban and urban farming systems, both with their distinct characteristics and interactions, have emerged and are expected by some experts to assume great importance in the years ahead.

Poor people in the cities are constantly faced with the problem of how to survive at the household or micro-level amidst economic decline and the lack of job opportunities. "Rather than return to the countryside, much of this urban population has resorted to any means at their disposal to survive in the city. The various survival mechanisms of the urban poor have come to be called the 'informal sector', so named by the International Labour Organisation's investigation of employment conditions in African economies in the 1970s." (Maxwell and Zziwa 1992).

Urban agricultural production is often included in the informal sector, because cultivation and livestock rearing within urban sectors were generally forbidden during the colonial period. This hostile attitude by the authorities toward urban farming has usually continued after independence. Nevertheless, urban agriculture has been an integral part of African cities from the beginning of their development, as pointed out by Rakodi (1988). This fits also well with the perception of urban migrants, who view the city as their farm (Aronson 1978), as it becomes part of their extended geographic sphere, while the rural home often remains home, despite their living in the city.

Some authors emphasise the adaptation of urban agriculture to certain characteristics of urban life in transition: a break between rural production and urban consumption that is marked by the need to supply less expensive European-type market products such as green beans, green peppers, tomatoes, etc. The most commonly produced goods are high-value perishable products like vegetables and fruits, as well as small livestock, poultry, fish, and snack food. Thus Bamako, capital of Mali, would be self-sufficient in vegetables because of urban market gardeners.

The same applies to essential provisions for the city of Lomé, where competition of other origins exists: neighbouring villages, and importation of specific products from Burkina Faso, Niger, Mali, and Europe. Urban agriculture would then be generating income and employment in an urban environment through a network of interdependent activities connected to it. These peripheral activities are found in the artisan production sector (blacksmiths, masons, carpenters, etc.), as well as in the service sector (transportation of fertilisers, phytosanitary products and seeds, repair of motor pumps, etc.) and marketing sectors.

2. Urban and peri-urban agriculture: A source of income and nutrition.

Three fundamental observations concerning urban agriculture are noted by Maxwell and Zziwa (1992):

1. Urban agriculture is an important component of household survival strategies for the urban poor.
2. Urban agriculture has provided livelihoods and food to an increasing number of urban and peri-urban residents.
3. Urban and peri-urban agriculture have a potential to provide productive jobs for the urban unemployed, while contributing significantly to the food provision of Africa's cities.

According to Amuzu and Leitman (1991), in Accra an estimated 3 percent of the city's labour force are engaged in urban farming, and 90 percent of the city's vegetable supplies are supplied by urban farmers.

Urban agriculture is an important source of income and nutrition for urban populations. As the share of wages in income has fallen drastically under the effects of structural adjustment programmes, increased engagement in farming in urban and peri-urban areas has been the most visible response to the crisis.

Horticulture, mainly vegetable production, has expanded in and around West African cities as an informal activity practised by poor and landless city dwellers. The broad diversity of horticultural crop species allows year-round production, employment and income. Growers have realised that intensive horticulture can be practised on small plots making efficient use of water and land resources. Real efficiencies are being made by productive use of under-utilised resources such as vacant land and unemployed labour.

Vegetable cash crops are often produced by experienced farmers and marketed directly or by short chains without much processing. In the case of leaf vegetables, harvesting and sales must take place daily. They provide a quick return to meet a family's day cash requirement for purchasing food. Leafy vegetables are particularly perishable and post-harvest losses can be reduced significantly when production is located close to consumers.

Short production cycles and rapid adjustment to market demand and climatic conditions result in a surprisingly high, regular income to peri-urban farmers as well as to market entrepreneurs. Some urban and peri-urban growers are moving more and more into intensive production of high value-added produce, rather than basic foodstuffs; such activities can become major sources of income for more sophisticated members of the population who have investment capacity.

The pervasive economic importance of peri-urban irrigation has created at all production levels an investment incentive for private economic operators. Under the pressure of economic and political powers and encouraged by international organisations, various actions have taken place in an attempt to help organise this new production sector. NGOs are getting involved more and more. This movement is supported by the credit institutions that are lending to individuals and also on a group basis.

3. Constraints

Despite its success and growing importance, peri-urban irrigation is still subject to numerous constraints. Among them are insufficient access to clean water, uncertainty about land tenure, level of know-how, increasing pressure and marketing difficulties.

3.1 Land

Historically, urban farming in African cities has been a major activity in African cities since pre-colonial days. According to Winters (1983), in hot, often humid regions such as tropical Africa, the problem of storing food compounded the problem of transporting it. The fact that urbanisation was so independent of trade was one more reason for cities to be self-sufficient in food. Urban farming in contemporary African cities is largely unrecognised, unassisted and in some cases outlawed because of the supposed hazards associated with it.

Agricultural activities have influenced and determined urban land-use and the morphology of cities in Africa. Cities such as Kumasi, Ghana, and the Yoruba towns of western Nigeria were surrounded by a zone of intensive farming in which the majority of residents worked every day (Winters 1983).

According to Mougeot (1994), urban farming will likely continue to expand because of the current conditions prevailing in African countries. These conditions include rapid urbanisation, ineffective agricultural policies, crippled domestic food distribution, constrained government spending, removal of subsidies, soaring inflation, rising unemployment, natural disasters and civil strife.

Urban agriculture is developed in areas that, generally, have a precarious status and whose development or distribution in the town often depends on the unilateral ideas of municipal authorities or specific urban management institutions. Land under the authority of these legal institutions is used without formal authority but with a varying tolerance, which is not always backed by rationality. Thus, the market gardens that have long been tolerated in Bamako incited some people to grow grains (millet, corn, etc.) on interstitial strips in the towns with successful results. Since 1989, the authorities have prohibited this practice since the high stalks created a bush that served as refuge to thieves (Diallo 1993). The most often cited example of this occurred in Bafoussan, Cameroon, during the 1970s, when the mayor arranged for the corn to be cut in order to clean up the town.

Land is often free in the interstitial areas. However, complex rental systems have often been developed through the succession of occupants or the informal involvement of administrations in the activity. Leasing is also common between land-owners and producers (Lomé, Lagos). In the latter case, the profitability of using this land for housing projects, not at all comparable to the profitability of urban agriculture, determines the risk of the activity.

The status of the activity varies, in contradiction to a premature classification in the informal sector, which, nevertheless, remains the most current. In Zaire, the government has promoted it to an official project, supported by outside funding. In Nigeria, the government has considered urban

agriculture so important that it has made all inputs tax-exempt (fertilisers, seeds, etc.). For the majority, however, urban agriculture is simply an activity that is tolerated.

3.2 *Need for inputs*

The intensification of agriculture in and around the cities requires inputs such as fertilisers, biocides, labour, and water. The most expensive inputs in terms of direct costs and possible environmental impact are fertilisers and pesticides. This makes it worthwhile to look at alternatives (waste recycling, integrated pest management).

Waste recycling for urban and peri-urban agriculture is a potentially powerful, locally responsive approach to addressing waste disposal problems in African cities. The concept is not new to Africa, but to promote it on a large scale requires fundamental changes in planning Africa's urban areas, as well as change in attitudes of city governments, decision-makers, and urban planners. Change demands a commitment by them to include urban cultivation and organic waste recycling as an integral part of the built environment.

3.3 *Water*

Agriculture requires water, which may be obtained directly from rainfall (rainfed farming), or indirectly from a variety of sources such as rivers and streams, wells, rainwater harvesting, piped water and wastewater (irrigated farming). Water is essential for urban agriculture. For this activity, often considered to be on the borderline of profitability, access to low-cost quality water in the city raises enormous difficulties. The use of traditional wells is currently practised in many towns located far from rivers. Lacking a simple solution, some stopgap measures, like using polluted water from the sewage systems, expose the producer as well as the consumer to potential danger. One could mention, as an example, the use of wastewater to irrigate crops in Cambérène and Yoff (Dakar, Senegal) as well as in some areas of Lomé.

In Dakar, about 100,000 cubic meters of domestic wastewater is evacuated daily. Use of this resource could prove interesting because of some advantages like availability of more water and reduction of agricultural inputs such as fertilisers. However, because a large number of farmers use this untreated urban domestic wastewater either as the only source for irrigation or to supplement shallow wells, a potential danger for contamination exists.

The speed and unplanned nature of urban growth generates water problems and closely related sanitary problems, and most cities have an irregular water supply. As in peri-urban areas, irrigation is often proposed as an efficient and lasting way of using land. According to Livingston (1987), in vegetable production for example, competition for water can become a key factor influencing the viability of agriculture in cities.

3.4 *Health*

The practice of reusing waste in food cultivation in Africa is not new. Most African countries have traditionally utilised various types of materials to maintain and improve the productivity, tilth and fertility of agricultural soils. The indigenous kitchen gardens, compounds and community gardening systems of West Africa have made extensive use of organic materials. Promoting the reuse of waste in urban cultivation on a large scale, in areas with high population concentrations, raises the issue of health.

The issue of health is critical in urban and peri-urban agriculture. Urban solid waste in African cities contains large quantities of pathogens due to the presence of human excreta. Application in farming of such untreated waste can pose significant health risks both to those who have direct contact with it, and also to the general public who are affected through the food chain links (Furedy et al. 1997).

4. *Conclusions*

The combined effect of increasing population size and shrinking land availability demands increased food production. This can only be achieved through a more intensive management of resources in

all aspects of food production. Urban and peri-urban agriculture should be included in such an approach, to be encouraged and guided by the authorities.

Urban farming has been taken up by the urban poor as a survival strategy, and more food is being produced in the urban and peri-urban sphere as a result. Encouragement and enlargement of such private enterprise by the authorities through the organised and proper use of treated urban wastewater could benefit both the urban poor at the micro- and household levels, and the urban food situation at the macro level.

Urban and peri-urban production systems need development support because projections estimate that within less than 30 years, half of the world's population will live in urban areas. Measures to boost agricultural production play a very important role in achieving development policy goals by reducing food insecurity, and increasing income and employment opportunities.

Urban and peri-urban agriculture offer partial solutions to several problems created by rapid urban growth in the developing world and especially in West Africa. Increased production through the application of efficient technologies to urban and peri-urban agriculture decreases food prices and increases consumption. If vegetable production systems are prominent among peri-urban and urban agricultural enterprises, people's consumption of them will increase. This means access to food and a way to overcome malnutrition for the poorest segment of the population, a source of income and high-quality food at low cost and possibility of savings for a large majority of people.

Urban farming is a competitive economic activity providing new jobs to many in the city, especially for people with limited mobility, low skill and little capital, including women and children. However, the benefits of urban agriculture extend beyond better nutrition, poverty reduction and jobs for the poor. Agricultural methods make the most out of scarce land, water and other natural resources, and often make use of wastes and industrial by-products as well. From the environmental and economic point of view waste reduction is interesting.

Urban areas have to be considered as vast nutrient sinks and only immense fertiliser imports and/or recycling of nutrients will sustain the food supply from the urban production areas. Therefore, in addition to agro-industrial byproducts (poultry manure, sawmill dust, brewery refuse), household refuse need to be valorised and considered either as an alternative or additional nutrients source. However, care has to be taken because of waste contamination by pathogens and agro-chemicals.

Peri-urban and urban vegetables will play a multiple role in achieving development policy goals (food security and malnutrition, job opportunities and poverty alleviation, support of women). When formulating future development plans, it is important that urban-rural linkages are fully understood; neither urban nor rural development should be treated in isolation. In view of the large gap in data on food and related nutrient-flows between rural, peri-urban and urban areas, studies must be conducted to minimise peri-urban nutrient depletion and to maximise environmentally sound land management. Decision support systems for city planners could be designed as one result. A network of approaches involving all stakeholders of urban development and peri-urban agriculture would be appropriate. As well, it would be a good idea to compare several African cities within the network and benefit from their experiences.

The informal private sector of urban and peri-urban farming should not be taken over by the government, although the treatment of urban wastewater and its subsequent use in urban agriculture does require government planning, investment and extension services. Participatory development in urban and peri-urban farming may enable proper integration between central planning of wastewater treatment and its use by private farmers. Special legislation for use of urban and peri-urban for farming purposes should be made as flexible as possible.

Municipalities in the Netherlands, for example, allow certain municipal areas, divided in small plots, to be farmed by interested individuals without their becoming owners of the land. Temporary permits are given and a small yearly fee has to be paid. Yearly extension of such permits in urban and peri-urban Africa could be made conditional on proper use of the wastewater and compliance with public health requirements.

The occurrence of severe drought will undoubtedly cause a decrease in the level of food production under rainfed agriculture. The resultant decline in locally produced food needs to be compensated

for, frequently by supply from existing reserves or imports, in order to maintain food availability and consumption at a secure level.

One of the characteristic aspects of urban development is the widespread availability of piped water, a sewage system and the resultant production of urban wastewater. Because water is in the short run even more critical than food for human survival, governments have usually planned to maintain the piped water supplies to cities from secure water resources which can be used even during times of drought. Hence, the output of urban wastewater will also continue during meteorological drought. This rather stable production of urban wastewater should be perceived by planners as a real asset not to be wasted!

Four reasons can be given for the importance of urban wastewater treatment and purification in Africa:

1. Urban wastewater needs to be contained and purified for reasons of public health.
2. Raw urban sewage should not be permitted to flow freely on the surface, polluting streams, surface water and groundwater resources.
3. Treated wastewater can be used successfully and safely, at or near its urban source, in urban and peri-urban farming to produce food without the need for chemical fertilisers.
4. Urban wastewater will be available even during periods of drought, enabling urban and peri-urban food production to continue and thereby increasing urban food security.

Since urban sewage treatment requires government planning and supervision, it seems reasonable to suggest the need for agricultural extension education, legislation, and supervision concerning the agricultural use of the treated wastewater by individual urban farmers, in view of possible health hazards. However, a detailed World Bank report about wastewater irrigation in developing countries (Shuval et al. 1986), concluded that public health positions have often been overly conservative. The report recommends the use of low-cost stabilisation ponds, considered to be a robust method of wastewater treatment well suited to the needs of developing countries. "In fact, as we have already pointed out, 20-day stabilisation ponds can remove almost all bacteria and viruses and can produce an effluent suitable for unrestricted irrigation of vegetables" (Shuval et al. 1986).

Despite the official neglect from the colonial period to the present day, it is clearly apparent across contemporary Africa that urban farming is widespread and it is becoming a permanent feature of the landscapes of many cities. Proof of its persistence and stability is reflected in the acreage and land farmed within and around the built-up space of African cities and by the number of urban residents engaged in urban agriculture. A number of African countries have recognised the importance of urban farming and have taken steps to incorporate urban agriculture in their city plans.

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