

A common saying is that necessity is the mother of invention. Lack of space creates creativity. This is shown in the myriad of forms in which people with little or no land produce food, fuel and other raw materials. Gardens on roofs, fast-growing trees as fences, plants inside old tyres, rabbits in abandoned garages, even a fish hatchery in the home. People in cities and other densely-populated areas have developed highly intensive forms of farming.



Farming at close quarters

The editors

In rural areas, homegardens are multi-layered integrated systems of plants, both annual and perennial, and animals which need not be raised in large number and can be "harvested" as needed, eg. fruits, vegetables, spices, chickens, dairy goats.

Closer to town, in periurban areas, horticulture and livestock production tend to be more market-oriented and less diversified. It appears to be mainly the domain of men, who invest in hired labour and agrochemicals.

Inside a town or between town quarters, urban and intra-urban farming is commonly a response to economic stress. Particularly in this time of structural adjustment and rising unemployment in many developing countries, poor urban people are farming for pure survival. Most of this work is done by women; few, if any, external inputs are used. Urban as compared with rural gardens are more likely to be limited to annual crops, especially when the family is not sure how long it can use the land.

Finding space

In towns, the better-off people usually have space beside the house for some crops, trees and animals. The poor living in slums or low-cost housing areas have next to no space for anything except sleeping. Also recent immigrants to towns - like ethnic minorities in some rural areas - often have difficulty gaining access to land to live on, let alone to farm.

These poorer families and immigrants are lucky if they can find patches of unused

land elsewhere in town. In parts of Africa, the unbuilt areas between city quarters and even in some spacious city centres are used for crops or grazing for at least part of the year (Mbiba; all references are to articles in this issue). Such areas officially belong to the government or absentee owners, and the illegal farmers run the risk of losing their crops or animals occasionally to razzia by the police. Other urban poor are not so lucky: they can find no space at all.

Family benefits

Gardens and small stock provide vitamins, minerals, proteins as well as variety for the family diet. Many middle-class and poor people also seek to grow basic foods, like maize or cassava, to cut down the grocery bill. Micro-farm products can also be sold to generate some cash. Small animals are particularly useful as a savings bank.

Micro-farming close to the living quarters is handy for women who need to provide for their children through productive work but must combine this with homekeeping and childcare. It also gives women a chance to recycle household wastes. Remains from food processing, wash water, sweepings, ash from the hearth and droppings of small stock can be used in the garden, while crop residues, weeds and kitchen wastes can be fed to the animals.

Environmental benefits

Especially in urban areas, micro-farming can have important environmental benefits. During heavy downpours, the cultivated land allows drainage of water which would otherwise run off closed or compacted surfaces and cause flooding. The plants filter dust from the air. Their transpi-

ration improves the microclimate. This is seldom the goal of urban farming, but is nevertheless a positive byproduct.

A further environmental advantage of farming in and around the cities where the products are consumed is that less fossil fuels are used than in transporting products from distant rural areas. The closeness of the farms also allows easier recycling of urban wastes for use in farming.

It is striking that the potential benefits are closely linked with environmental threats, much more so in urban than in rural micro-farming. Dust, garbage and sewage can also pollute the crop products. Animals can convert waste to food and their manure can fertilise gardens but, if not well handled, they and their manure can threaten human health in congested areas.

Technology and innovation

In long-settled areas of dense population such as parts of China, Sri Lanka and Indonesia, systems of highly diversified and integrated farming in extremely limited space have been developed over generations. In other areas, especially where cities are rapidly growing and space to produce food is rapidly dwindling, new systems such as hydroponics (Midmore) and the keeping of micro-livestock such as rabbits (Ateh) are being introduced.

The closeness of a large market offers urban and periurban micro-farmers the chance to specialise in new activities, eg. in producing flowers, snails, fresh milk, mushrooms, spices, fingerlings. Many such activities can be managed part-time and thus combined with other work. However, usually only those people who already have some employment and thus cash can invest in these new enterprises,

as credit is rarely available for establishing micro-farming enterprises in cities.

Little is documented about innovation processes in city farming as a result of interaction between immigrants bringing techniques from their different home areas. As urban farmers try to adapt to the new surroundings and the confined spaces of town, they must be a rich source of experiential knowledge. Moreover, the immigrants who continue producing on a small scale the foods from their areas of origin may be maintaining valuable gene banks. In view of the shorter distances and better transport services in town, it may be easier to organise farmer-to-farmer exchange than in many rural areas (Cáceres & Arbomo).

Problems and challenges

In rapidly urbanising areas where space and basic inputs such as water are scarce, people have demonstrated great ingenuity and innovation in choosing or creating sites and in using wastes and sewage water for farming. But these techniques are not without their dangers.

The use of untreated sewage can lead to food contamination and health risks for consumers. Pollution from industry and motor vehicles can lead to dangerous con-

centrations of heavy metals such as lead and cadmium in farm produce from towns, roadsides and waste-disposal sites (Drescher). Both producers and consumers need more information about sources of contamination, ways of diminishing it and suitable choice of product depending on type and level of pollution. Here are challenges for agronomic research.

Other problems in urban areas are theft, land rights and municipal regulations which constrain production, and offensive smells, noise and property damage by animals (Mbiba). Resource users with different specialisations (eg. gardeners vs herders) and from different ethnic groups are living closer to each other in towns than in the country. More conflict can be expected. Urban planners and law-makers need to work together with resource-users in finding ways to negotiate and safeguard use rights and to manage conflicts. City farmers could better assert their claims for legislative support if they organised themselves in interest groups. Here are challenges for social action research.

What is research doing?

Thus far, most research into micro-farming has been concerned with rural homegardens, often presented as ideal agroforestry

systems. Closer to towns, research has been mainly on periurban high-external-input commercial gardening and animal production (poultry, pigs, dairying).

Less attention has been paid to the conditions and problems of micro-farming by poor families inside town. This research has been, thus far, largely descriptive: who cultivates and where, crops grown, cultivation systems and, more recently, contribution to family income and nutrition. There is very little attention to technical aspects and ways of dealing with pollution.

The organisations, mainly NGOs, promoting homegardens have focused on nutrition education, training women in composting and preparing vegetable beds, and providing exotic vegetable seed. Some promoting urban gardens have also addressed questions of group organisation. But few have given support to developing improved production techniques based on local practice.

Here, important questions are water conservation, vertical gardening, intensified nutrient flows, waste recycling, pest control and health aspects related to micro-farming in densely-populated areas.

Join experimenting farmers

In the few cases where scientists have taken up the technical challenges of micro-farming, on-station researchers are developing "efficient homegarden" models, with a view to transferring a finished package to the producer. There is a notable lack of collaborative research and development by technical scientists and experimenting micro-farmers. Until the scientists catch up and can provide the much-needed support, the main work of technology development and adaptation for micro-farming will continue to be done by the farmers themselves.

Martha is a city farmer

Martha lives in Kibera, Nairobi's largest slum. She is 38, married and has 7 children. Martha and her husband Peter came to Nairobi in 1975 to seek jobs, as there was no land available in their home area. After failing to earn a living from reselling vegetables bought at market, Martha ventured into farming in 1979.

The couple cultivates three plots on nearby "vacant" land between the slum and an official residential area. The plots are 15-30 minutes' walk from the house. The largest plot (76 x 39 m) is planted with spinach, kale, maize, sweet potatoes, beans and several fruit trees. The land is sloping but there is little erosion, as Peter and Martha built soil-retaining barriers using rocks removed from the field. The sewage water they use to irrigate and fertilise is from blocked drains, but the city council tries to prohibit its use. The second, somewhat smaller plot is separated from the first by another producer's field. It is further up the slope and has stony and less fertile soil. There, Martha plants rainfed crops such as maize, beans, Irish and sweet potatoes, and cowpeas. The furthest and smallest plot (10 x 5 m) is near a stream and prone to water logging and flooding. There she grows arrowroot and sugarcane, as they are adapted to these conditions.

Even though cultivation is illegal in Nairobi, Martha has not been harassed by local authorities. If she could secure the permanent use of her plots, she would like to plant mangoes, lemons and multipurpose trees, and begin

using manure to improve crop production. Major causes of crop loss are theft, irregular rainfall, and insect and disease infestations in the vegetables. When she has money, she buys pesticides to reduce the latter. Currently, the family has only one chicken, as most of their chickens were either stolen or died from coccidiosis. They used to have a (pregnant) goat, but she was recently stolen.

Both Martha and Peter spend considerable time working in their plots. Neither has regular employment other than farming. Occasionally, they earn some cash from casual jobs such as tilling or weeding for other people, house building or selling water in residential areas. Peter is more likely to get such jobs than is Martha. Her time is limited by domestic activities such as preparing food, washing clothes and child care. When not in school, the older children collect fuelwood, fetch water, and help with meals and weeding. Most of the household income comes from the sale of spinach and kale. The money is used to pay rent and school fees and to buy additional food.

Martha hopes to get a loan from a local NGO so that she can start a business selling maize and second-hand clothing. But even then, she plans to continue farming, because of the high cost of food.

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