NGO EXPERIENCES IN LIMA TARGETING URBAN POOR THROUGH URBAN AGRICULTURE

Andres Dasso and Teobaldo Pinzas

1. Introduction

The capital of Peru, Lima, is located on an infertile sandy strip along the Pacific Ocean. The average rainfall is 0.0 mm. In this rather unlikely environment, attempts to use urban agriculture as an instrument to improve the living conditions of the resource-poor urban population have been implemented since the crises in the late 1980s.

Between the 1950s and 1990s, Lima experienced very rapid growth. This was due mainly to migration, not only from rural areas but also from smaller towns.

Table 1: Metropolitan Lima: total population (x 1000)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Population</td>
<td>1.837</td>
<td>3.297</td>
<td>4.700</td>
<td>6.343</td>
<td>7.060</td>
</tr>
</tbody>
</table>

Source: Instituto Cuanto SA 1994

The migrants needed a place to live, resulting in mounting pressure on available land.

The city expanded in two ways - firstly, by the development of residential areas and commercial centres on the little agricultural land in watersheds, to cater to the needs of the richer classes able to sustain long-term investments; and secondly, through squatting by people with few resources, especially migrants. Squatting occurred mostly in desert areas on the fringes of the city.

The expansion was horizontal (individual houses) and not vertical (high-rise apartment buildings). As a result, Metropolitan Lima covers a very large area, extending to over 2,800 km². Table 2 illustrates the process of urbanisation in the Rimac Valley, where Lima was founded, and in the Chillon Valley, which until 1940 was an exclusively rural area. This urbanisation continues today.
Table 2: Lima and Callao: agricultural surface

<table>
<thead>
<tr>
<th>Year</th>
<th>Rimac Valley</th>
<th>Chillon Valley</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Agricultural area</td>
<td>Urban area</td>
</tr>
<tr>
<td></td>
<td>ha</td>
<td>%</td>
</tr>
<tr>
<td>1940</td>
<td>16,572</td>
<td>100.0</td>
</tr>
<tr>
<td>1964</td>
<td>27,275</td>
<td>84.6</td>
</tr>
<tr>
<td>1969</td>
<td>23,334</td>
<td>72.4</td>
</tr>
<tr>
<td>1976</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1979</td>
<td>9,064</td>
<td>28.1</td>
</tr>
<tr>
<td>1989</td>
<td>1,815</td>
<td>5.6</td>
</tr>
</tbody>
</table>

Source: Arroyo 1990

1.1 Demographic aspects

Nearly 30% of Peru’s population or 7 million people live in Lima. The second biggest city, Arequipa, has an estimated population of only 696,900 inhabitants. The population density in Lima is approximately 2,600 inhabitants/km$^2$. Density varies from district to district, reaching a high of 27,972 in the old central district of La Victoria, an average of 14,274 in the central districts of Lima (La Victoria, Rimac and Brena) and an average 5,422 inhabitants/km$^2$ in the upper-middle-class residential districts (Miraflores, San Isidro, Surco, La Molina). Most migrants live in the pueblos jovenes, marginal areas, mostly former squatter settlements, with an average of 8,980 people/km$^2$.

Lima’s work force is estimated at 3,373 million (1997). Employment figures (1995) indicate that only 16.6% of the economically active population is adequately employed and 76.2% is underemployed, while direct unemployment is relatively low: 8.8%.

The majority of Lima’s labour force makes a living out of informal activities, mainly petty services, with low productivity and low incomes.

1.2 Presence of urban agriculture

In terms of production, periurban agriculture in Lima is by far the most important type of urban agriculture. It takes place in small plots around the borders of the city. However, even the periurban areas quite far from the city centres are under heavy pressure as the industrial and residential areas continue to expand.
Home gardens contribute to foodsecurity in the poorer quarters of Lima. The producers are mainly poor migrants to the city. (Picture Andres Dasso)

Guinea Pig breeding. The materials needed are cheap and locally available (Picture Andres Dasso)
The single most important crop is maize, grown both for human consumption and for cattle fodder (77% of the cultivated area). Other important crops are potatoes, sweet potatoes, onion, garlic, lettuce and various types of beans. Also some crops to supply different industries are grown: marigold (for the animal food industry) and cotton. Production costs are lower than those in intraurban agriculture. Cattle raising is also practised and can be quite profitable, especially when focused on producing beef for the Lima market.

2. NGO experiences in urban agriculture

Intraurban agricultural production will be analysed here as a strategy for improving the living conditions of poor urban households. In this section, the NGO (non-governmental organisation) experiences with community vegetable gardens, hydroponics and raising of small animals will be discussed.

2.1 Vegetable garden projects in slum areas

In the 1980s, when the country was severely plagued by economic crises, some "assisted" experiences in urban agriculture were initiated. The projects were supported by NGOs and other institutions for social work and were targeted at low-income families. These families mainly live in the pueblos jovenes (slums). As a norm, the activities were heavily subsidised. The majority of these activities involved either family or communal vegetable gardens.

The objectives of initiating the vegetable gardens were:

- to improve food consumption, through home consumption of the vegetables;
- to increase income through the selling of produce, or both consuming and selling;
- to strengthen grassroots organisation, for which the vegetable projects were an instrument.

In the period 1984-90, Asociación Peru Mujer obtained grants for a project aimed at low-income women in the southern cone of the city. In 1987-95, the Ministry of Agriculture, with HUFACAM, formulated a national programme based on these experiences, which was implemented in several cities. Vegetable gardens were established in household plots, schools, hospitals and public spaces. A corps of women promoters was thoroughly trained and the project developed sets of training materials that were used to train participants in other groups in different parts of the country. Usually, the land for the gardens was located close to points of water supply.
People working in the gardens were poor or extremely poor. This limited their access to services. It was usually the women who worked the land together with their children. They were also responsible for selling the produce. A wide variety of vegetables were cultivated, as well as aromatic plants, herbs and potatoes. The size of the gardens ranged from 60 to 200 m². The gardens were on sandy soil, typical for this part of the city. The use of solid waste to produce compost was very common from 1980 to 1990. The gardens needed organic matter and fertiliser to improve their soils. No chemicals were used, and pests were controlled with domestic methods. The women were trained to do composting, using household leftovers, chicken and guinea pig dung, etc.

Irregular water supply is one of the main constraints for gardening in Lima. The groups had to organise themselves in order to ensure sufficient water. This was especially important in areas where a group had no access to the public network, and water had to be bought and kept in tanks. Tap water is no longer free since water gauges have been installed. Water fees have also become limiting factors. Free available irrigation water is readily noticed by vegetable growers. However, free water usually means untreated wastewater. Thus, part of the vegetables consumed daily by the Lima urban population comes from parcels liberally irrigated with untreated wastewater.

Usually, implementing vegetable gardens was part of a set of proposals by the assisting organisations to the local people. In most cases, however, not enough attention was paid to adapting the activity to the conditions of the families (skills, availability of physical space for the garden, labour time, access to adequate water supply). Despite many efforts to adapt and develop an adequate proposal for vegetable gardens, very few families continued after the project subsidy came to an end. On the basis of an evaluation, including interviews with staff of the NGOs involved in the projects, it has been argued (Pinzas 1994) that these vegetable gardens are not a sustainable alternative in the Lima context for the following reasons:

- limited availability of water in the project area; low-income families in particular face difficulties in ensuring sufficient water supply to their vegetable gardens;
- small household allotment, leaving very little space for adequate gardens;
- vegetables are not a prominent part of the families’ normal diet; and
- above all, the opportunity costs of the gardens are high: “Families are better off trying to get a living from petty services; both in terms of money and food intake, growing vegetables is a less rewarding use of time.”

In Lima, the pueblos jovenes have vast experience in popular organisation, such as community kitchens, the Glass of Milk programme, etc. In this sense, the
community vegetable gardens certainly fitted in and contributed to consolidating the organisational levels of the groups. The home gardens also facilitated forestry programs of the Ministry of Agriculture, in which the protection of crops, green fences, wind curtains, etc. are promoted.

2.2 Experiences in household hydroponic production

In 1993, the Chile-based FAO Regional Office introduced a training package for what was called "popular hydroponics". Hydroponics is a technique of growing plants on water and hydroponic fibres to which necessary chemical nutrients are supplied. In response to this support, several initiatives started:

- since 1994, the Centre for Hydroponic and Mineral Nutrition Research (CIHNM) of the National Agricultural University La Molina (UNALM) implements outreach activities such as training courses and international workshops;
- some NGOs and schools now promote hydroponic production of vegetables for low-income people;
- some small-scale private firms engaged in the production of lettuce and tomatoes now use hydroponics. The produce is sold to the two supermarket chains operating in Lima. There is a small market in Lima for good-quality non-contaminated vegetables (and, to a lesser extent, strawberries). The buyers are aware of the health hazards of vegetables grown using heavily polluted water. The hydroponic produce is sold at a premium price, which can easily be twice as high as the price for ordinary vegetables. The market is thus restricted to higher-income consumers.

Two NGOs promote hydroponic production for poor families: CIDIAG (the Centre for Research and Development of Self Management) and Imagen Educativa. Each organisation designed a standard module for household hydroponic production. The modules are intended for small enterprises for the marketing of vegetables. Both men and women can be producers of hydroponic vegetables. The families use tap water from the public water-supply system. In the case of CIDIAG, tables covering a plot of 200 m² with 550 plants of tomatoes was designed. The total cost to establish this model is estimated at US$ 900. CIDIAG estimates that the sale of the tomatoes plus the produce of four “tables” of lettuce, at current prices, means a monthly family income of about US$ 200 which, in the Peruvian context, would be an important contribution. Imagen Educativa estimates the costs for establishing a production area of 150 m² of tables of lettuce at US$ 1,700. The costs for 80 m² for tomato production are estimated at US$ 900. Both NGOs, and CIDIAG, in particular, have adapted the technical package, in response to the difficulties
confronting urban farming. The adaptations aim to reduce the required investment and the variable costs, as well as to make the management of production simpler.

Hydroponic production is rather complex and is considered more difficult than conventional vegetable growing. The poor families with limited skills and resources have difficulties in adopting the production technique. Careful training and permanent technical assistance have been indispensable. Most families involved in the projects are the descendants of migrants. Although their parents came from the countryside, they were born and brought up in an urban environment and therefore do not have a practical knowledge of agriculture. Besides, the idea of landless cultivation and technical management are very new to the farmers, and need explanation.

The preparation of the production site involves investments far above the financial capacity of the families. Both NGOs do look for cheaper and suitable alternatives for the inputs needed, with no charge to the producers for the time invested. NGO staff provide support in the acquisition of inputs and equipment, in selecting the most adequate alternative input, by buying in bulk, and by advising on the appropriate doses. CIDIAG also sponsored research to substitute the standard nutrient solution based on chemical fertilisers. This resulted in a solution of humus appropriate for growing tomatoes. However, individual families have difficulties even to get hold of this.

CIDIAG designed the set-up so that the slope of the parcel is used to gravity-feed the solution to the vegetables (tomatoes), thus avoiding the purchase of an electric pump and timer. The hydroponic production of lettuce is done on tables, the single biggest investment cost. CIDIAG identified a source of cheap wooden planks (discarded cargo pallets), thus significantly reducing costs.

For those who succeed in managing the technology and are currently producing, acquiring regular access to markets poses a formidable challenge. Hydroponic production is more costly than vegetables imported from the rural and periurban areas. This restricts the market to relatively affluent consumers, who shop in supermarkets. Supermarkets demand regular production of significant volumes of standard quality. On top of this, the producers need to have enough of a financial buffer. Supermarkets pay only about four weeks after delivery. All these conditions are difficult to meet for small-scale producers.
Imagen Educativa is directly marketing lettuce produced by the families participating in the project to a supermarket chain. The NGO has difficulties in achieving a regular supply of products of standard quality in sufficient quantity. Their scale of operations is very small; the total group size is 18 families, but the continuous supply for marketing is the produce of only two families each time. They have to compete with private firms engaged in hydroponic production.

Despite all the efforts to facilitate hydroponic production, the projects have been besieged by the desertion of participating families. After almost two years of project implementation, each organisation is now trying to consolidate a group of 18 families as hydroponic producers. Both projects will be extended for some time in order to consolidate the groups.

2.3 Production of small animals

Up to the 1960s, even within residential areas, raising small animals was quite common in Lima. Usually the animals were bought alive in markets and kept at home to gain weight and to be slaughtered for special occasions, like birthday parties and Christmas Eve. At the time, chicken was even more expensive than beef and other meat, and poultry consumption was not as common as it is today. From the late 1960s onwards, large chicken farms were established and the price of poultry products declined to the point that chicken meat now costs about one third the price of beef and is widely consumed (El Commercio, September 1999.)

Since then, raising small animals for household consumption has declined. However, a number of families still keep animals for food – on flat roofs, in backyards, etc., even though it is more expensive than buying in the market. This indicates that there are more than strictly economic reasons for raising animals\(^5\).

More recently, a number of small firms appear to have engaged in the raising of quail. There exists a market for the eggs, mainly used as an ingredient in Chinese dishes, which are well-liked in Lima. The eggs are also promoted as a low-cholesterol alternative. The raising of quail does not demand a large space and is done both in entirely urban as well as in periurban areas. No estimate of volumes of production is available. Training courses to become a quail producer are currently advertised in the newspapers, and live birds can be easily bought in the markets.
The case of guinea pigs (v. Cuy) is different. Raising and consuming these animals is an ancient tradition in Peru, especially in the Andean highlands, where it is an appreciated part of regional cuisine. Consumption of guinea pigs is widespread, and the UNALM and INIA sell genetically-improved breeding stock.\(^6\)

Three types of guinea-pig producers can be distinguished:

- **household producers:** the production is for home consumption and irregularly marketed. The families produce, on average, 10-30 guinea pigs;

- **commercial family system:** most family labour is absorbed and more sophisticated breeding techniques are used. The production takes place mainly in the periurban areas. The producers have constructed special sheds and keep, on average, 30-50 animals; and

- **commercial enterprises:** this activity demands considerable investment. Very sophisticated techniques and systems are used. The enterprises are located mainly in the periurban area.

The majority of producers in the first two groups are women. In the third group, however, the producers are almost exclusively men.

Raising guinea pigs has also been promoted by projects aimed at household food production. The idea was to feed the animals with kitchen waste. In many districts, organic waste is taken care of by informal collection systems. However, the idea did not really work, as the availability of kitchen waste was very limited and it had to be supplemented with special feed, thus becoming a burden on the household economy. Nevertheless, there is a real market for this meat, based on the large Andean migrant population that lives in Lima. Consumer markets are mostly catered for by periurban producers who can grow their own fodder and probably also by producers from other regions outside Lima. At the same time, there are families who raise their own guinea pigs, as can be deduced from the fact that grass can normally be bought in small quantities in district markets, brought in from the edge of the city and even further away on a daily basis. Guinea pigs should be considered a delicacy rather than a staple food.

### 3. Concluding remarks

A review of different experiences in urban agriculture focused on the urban poor in intraurban slums in Lima shows the limitations of the interventions in vegetable gardens and small-scale animal production aimed at supporting low-income families.
Although - without NGO or governmental interventions - a number of families do grow vegetables and even keep fruit trees and raise some animals (guinea pigs, chickens), diminishing availability of land, scarcity of water and pasture, and the development of the chicken industry reduce the importance and impact of these experiences.

Projects trying to engage poor families in hydroponic production should be adapted to the family’s management capacities and technical knowledge, requiring a substantial training effort all along. Everything taken into account, these experiences are relatively very expensive and thus not easily accessible for poor families. Only very small groups benefit and all groups face serious problems entering the market.

From the perspective of amounts produced for the city population, periurban production stands alone as the principal system, using important areas around the city and supplying a significant share of the city’s food consumption. The sector is under increasing pressure as a result of the expansion of the city, which may end up making Metropolitan Lima entirely dependent on supply from producers from rural areas.

At the same time, there are small-scale private firms engaged in organic vegetable production, hydroponics, production of quail eggs, mushrooms and – more recently – aromatic plants for the huge Lima market, both inside the urban area and on the edges of the city. This small but expanding sector needs further investigation.

1 Metropolitan Lima includes the Province of Lima, with 43 districts, and the Constitutional Province of Callao, with 6 districts. Together, they constitute a single urban entity both physically and economically, however with two provincial governments.
2 This figure does not include the Lurin Valley and uses a more restricted definition of the area of Lima, leaving out the districts of Chosica and Lurigancho, where large agricultural areas are found.
3 Estimates based on the 1993 census.
4 Areas like Lurin are used by entrepreneurs who keep cattle bought from faraway peasant families, several hundred kilometres away, and fed until the animals reach a commercially interesting weight. Slaughterhouses have been established in Lurin and Ate in the Lima Valley.
5 Also a special breed of fighting cocks is raised. The volumes are not very big, but there are regular breeders all over the country, including in Lima.
6 Currently IDRC (the International Development Research Centre) supports a project conducted by INIA specialist Lilia Chauca.
References


Universidad Nacional Agraria de la Molina, Fundación para el Desarrollo Agrario FDA. 1995. 3er. Curso Taller de Hidroponía, sobre Un Nuevo Campo para la Agricultura, Lima Centro de Investigación de Hidroponía y Nutrición Vegetal. Lima