

AGRICULTURE

IN THE
CITY



**A Key to Sustainability
in Havana, Cuba**

**María Caridad Cruz
Roberto Sánchez Medina**

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*A Key to Sustainability
in Havana, Cuba*

María Caridad Cruz

Roberto Sánchez Medina

Outcome of the Research Project

*Evaluation of Urban Agriculture as a Component of the
Local Economy in Two Areas of Havana, Cuba*



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LIST OF ACRONYMS

AAA	AgroAcción Alemana
AGUILA	Agricultura Urbana
ANAP	Association National de Agricultores Pequeños
CP	Las Casas Posturas (Seedling Greenhouses)
EHM	Empresa Hortícola Metropolitana (Metropolitan Fresh Vegetable Company)
ESA	Empresa de Surministros Agropecuarios
INIFAT	Instituto de Investigaciones Fundamentales de la Agricultura Tropical
OAR	Organopónico de Celto Rendimiento (High Yield Urban Garden)
TCA	Tiendas Consultorios Agropecuario (Agricultural Support Stores)
UBPC	Unidades Básicas de Producción Cooperativa
UEAF	Agroforestry Economic Unit

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Chapter I

INTRODUCTION

In this book we present the results of a research project on urban agriculture, which has been practised for more than 10 years in the city of Havana. These results are considered part of the process of improvement that this new and important urban function is currently undergoing.

A team of 15 professionals from different fields of specialization has been working on this project for 3 years. None of them is exclusively dedicated to research, but they are all linked and committed to the development of agriculture in the city. Many other collaborators were invited to participate because of their experience in urban agriculture itself and/or as representatives of different organizations directly linked to the agricultural sector and to city management and control.

The multidisciplinary composition of the research team oriented the manner and methods of the research and, above all, the language and the simple and accessible way in which the information is transmitted. The target audience of this book, then, is not only researchers and high-level specialists but a wider sector, including producers, students, decision-makers and any other person interested, for whatever reason, in the management and control of the urban environment.

The possibility of exchanging information on the various subjects under study was, according to the members of the research team and their collaborators, the main value of this process. The subject matters were assessed from different angles, using different criteria and, for the first time, a critical evaluation process concerning the last ten years of urban agriculture in the city of Havana was achieved. As a result, it was possible to develop a proposal for including urban agriculture as a component of land management and as a continuing activity beyond periods of crisis and for reasons broader than its contribution to food security.

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The coordination and integration of the research results was carried out by specialists in the Fundación Antonio Núñez Jiménez de la Naturaleza y el Hombre, and the project itself had the financial and technical support of the International Development Research Centre (IDRC).

The research project started with the Latin American workshop seminar on urban agriculture that took place in April 1995 in La Paz, Bolivia, where the Latin American research network on urban agriculture was created (Red Latinoamericana de Investigaciones sobre Agricultura Urbana — AGUILA). The participants in this seminar, subsequently regarded as the first assembly of the AGUILA network, demonstrated the need for consolidating local and regional actions, sharing experiences and focusing their work on developing urban agriculture in Latin America and the Caribbean.

Notably, in the last five years in Cuba and specifically in the city of Havana, urban agriculture has enjoyed wide development as a result of the serious national economic crisis and as an alternative means to provide food for the population.

This experience in urban agriculture was developed during these years together with diverse economic, political and social changes that were also a result of the acute economic crisis. The main objective of these measures was to mitigate the emerging problems without giving up the achievements of the social revolution initiated in Cuba in 1959.

The purpose of this research project, developed by a multidisciplinary working group, was to articulate what was happening with respect to urban agriculture within that changing context. The project was proposed to the IDRC in Canada in 1996, after which there was a process of adjustments and approval by IDRC, the Fundación Antonio Núñez Jiménez and the Ministry for Foreign Investment and Economic Collaboration in Cuba, which ended in June 1998. The general objectives of the submitted and approved project proposal were the following:

- to determine, through the evaluation of the urban environmental requirements in their broadest dimension, the potential of urban agriculture as a dynamic component of the community economy and its integration with the other components of that economy in the region, in the short and medium terms.
- to place this research in a social context inside and outside of Cuba, given the importance of these problems in developing countries. The contextualization must be carried out within the research process with the institutions and the communities involved, not only in workshops

and working activities, but also by publicizing the final document within Cuba and abroad.

Obviously, these were inclusive objectives that linked different working areas while still considering the urban environment as a whole. However, five years elapsed between the design of the project, its approval and its execution, so what was designed in the context of the first five years of the 1990s now encompasses the whole decade. We have tried in this introduction to situate the reader in such a context so that he or she can evaluate the scope of the subjects studied in this book, especially those having to do with the economy of the community.

Urban Agriculture

Historically, Cuba has depended upon the importation of food to meet its needs,¹ since more than 30 per cent of its arable land is devoted to the production of sugar cane, whose main product, sugar, was until very recently the main economic staple in the country.

The collapse of the socialist block of Eastern Europe, beginning in 1989, meant the rapid loss of access to credit and to exchange advantages with an assured market that represented more than 80 per cent of the foreign trade and the supply of fuel to meet all of the energy needs for Cuba. The price of sugar, which in the middle of the 1970s had a momentary increase to 60 cents per pound, did not enjoy other similar increases and by 1992 its average price decreased to 9.0 cents. The importation of oil — around 30 million tons before this period — decreased to less than a half of its normal amount. The GNP, in turn, suffered a fall of 35 per cent until 1993.²

This situation of acute economic crisis in Cuba, called a 'special period' in the local political terminology, generated an intense scarcity of both imported and nationally produced food.

The satisfaction of the nutritional needs of the population decreased to 1,863 calories and 46 grams of protein daily, which represented 74 per cent and 61 per cent of the needs recognized as basic (2,500 calories and 75 grams per capita).

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Comparison of Daily Calorie Consumption per Capita in Different Years

	1985	1990	1993	1996
Calories/person/day	2,929	2,728	1,863	1,996

Source: Centro de Investigaciones de la Economía Mundial (CIEM). *Investigación sobre desarrollo humano y equidad en Cuba 1999*. Havana, Caguayo, 2000.

The deficit in the availability of food had an adverse impact on the state of the health of the population, as evidenced by the epidemic of neuropathy between 1992 and 1993. Without entering into discussion about the nature of the epidemic, the occurrence is attributed to the abrupt modification of the diet.³ Other health indicators that showed a notable deterioration as of 1990 were the nutritional state of pregnant women and the low weight of the newborn babies. This latter indicator had shown a visible decreasing trend during the eighties but started to increase in 1991. Its worst behaviour in recent years was reported in 1993 with 9 per cent, compared to 8 per cent in 1982, although since 1995 it had again shown a decreasing trend (6.9 per cent in 1997).

With the recovery levels that the Cuban economy is showing, it is estimated that consumption has increased to 2400 calories and 65 grams of protein daily,⁴ figures that are still below the basic daily requirements.

Along with the acute food crisis there was a complete suspension of housing construction programs, industries, road building and other investments, and the ability to maintain community services, such as garbage collection, was considerably reduced. As a result, the hygienic conditions in the cities deteriorated and small refuse dumps started to appear in residential areas.

The search for new solutions to these situations promoted the development of such measures as the massive use of bicycles to meet the crisis in public transportation, the use of more appropriate local building materials and techniques, and urban agriculture as one of the alternatives for increasing the availability of food. These experiences demonstrated an increasing ability among the population to respond to and solve problems.

Urban agriculture now, 10 years after its initial development, covers 12 per cent of the land base in the city of Havana, links more than 22,000 urban and pre-urban producers,⁵ provides the communities in the capital city with 150 to 300 grams per capita of fresh vegetables and culinary herbs daily⁶ and has largely eliminated the use of small refuse dumps for urban garbage.

By the middle of the 1990s, this urban agriculture had evolved from a subsistence production to an agricultural practice for consumption by the producers and for trading, based mainly on the use of local resources and with minimum transportation costs.

Although the same conditions of unresolved acute economic crisis make it difficult to establish with precision what the volume of the urban production represents in the total of food received by the city of Havana, it is also true that the figures mentioned above situate urban agriculture as an important component in reaching the basic nutritional requirements of the population.

Community Economy

The 'special period' also brought about changes in the government approach. The strong centralized and protective concepts of economic and political process in force up to this point underwent modifications, and some steps towards decentralization were taken.

During the first five years of the 1990s, we started to see, on the one hand, an increased role for the business sector in decision-making vis-à-vis the government ministries and, on the other hand, the emergence of new formulas to open spaces for the private sector in order to activate the economy through market forces. This transformation of the domestic economy included foreign capital, a component that had already been incorporated in the tourism sector since the second half of the 1980s.

The new social and economic measures were oriented in two directions: the reshaping of government employment in accordance with its real possibilities of financial management and the emergence and/or recognized and legalized expansion of non-governmental employment sources, which brought about significant changes in the employment structure.⁷

Employment Structure*

	1981	1996	1997	1998
Total of employed people	100.0	100.0	100.0	100.0
Government Entities	91.8	77.7	76.6	75.0
Cooperatives	1.1	9.6	9.1	8.8
Joint Ventures and Corporations	–	3.0	3.6	4.1
Political and Social Organizations	–	1.1	1.0	1.0
Private Sector (National)	5.5	5.3	6.2	8.1
Self-Employed	1.6	3.3	3.5	3.0

*In percentages.

Source: *Cuba en cifras 1998*. Oficina Nacional de Estadísticas, August 1999.

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It is worth noting that employment in the ‘cooperatives’ and ‘self-employment’ sectors, which play an important role in the local community economy, showed a significant increase in the years 1996–97 and then started to decrease in 1998. Among the measures taken during that period, it is important to highlight the following:

1. Authorization for more than 200,000 people to work as self-employed, with licences in businesses and activities that the government could not cover. The provision of these permits was in direct relationship to the rationalization of the labour force in a large number of government companies, to counteract the foreseeable growth of unemployment. Between 1990 and 1998, around 155,000 workers became unemployed.⁸
2. The handing over of more than 2,600,000 hectares of state-owned land to cooperatives of working people for commercial exploitation, in order to create the basic units of cooperative production (Basic Units for Cooperative Production — UBPC). This significantly changed the agricultural structure of the country.

Comparison of the Land Ownership Regime per Type of Producer in 1989 and 1997

Type of Producer	1989 (%)	1997 (%)
Government Companies	80.7	48.7
Cooperatives	8.6	39.4
Individuals	10.7	11.9

Source: Comité Estatal de Estadísticas. Dirección de Agropecuario y Silvicultura. Balance de la tierra del país por sectores. Havana, 1989; Oficina Nacional de Estadísticas. Anuario Estadístico de Cuba 1996. Havana, 1998.

It is important to note that ‘the handing over of state-owned land to cooperatives, field workers and farmers for commercial exploitation had changed the structure of landholding, making it different from ownership structure’,⁹ since the government still owns the land.

3. Unlike the situation in the 1980s when the market was controlled essentially by the government, new spaces were opened in the 1990s and new economic models and concepts started to operate in the domestic market. One such model was approved in September 1994 by the National Assembly of People’s Power, the highest government body. These were the so-called agriculture markets, which operate with prices governed by supply and demand.

The changes that occurred in the political arena were reflected basically in the creation of the People’s Council as an instance of grassroots

government that was closer to the people than the municipalities and was part of the policy to promote local initiatives for solving problems.

The People's Council had, and still has, among its main objectives the securing of greater participation by the community in solving problems and coordinating the cooperation among the administrative entities of Cuba through community monitoring and control.

In a general sense, we can see the predominance of a process that tended to favour the development at the grassroots level towards decentralization in the first half of the 1990s. This dynamic was not maintained in the second half of the decade, when a tendency towards slow consolidation prevailed without new significant structural changes.

There are as yet no government provisions or any other type of provisions to empower the People's Council or the municipalities to create their own economic relations. This restricts the ability of those levels of government to promote the establishment of new and more efficient ways of community participation while taking into account the availability of economic resources and the progressive formation of the community economy.

One can observe that the measures adopted at the beginning of the 1990s have not brought about the changes required in the community's ability to respond to local needs in a satisfactory manner. The exceptions are those services overseen nationally, such as medical care, education and essential public services.

It is important to mention, however, that aside from what is stated above, urban agriculture has reached a level of consolidation and development that places it as a firm, though modest, component of the local economy.

Cuba entered the year 2000 with evident signs of revitalization of the national economy, as can be seen in a number of constructive efforts. For instance, the development of the tourism industry, which became the foremost commodity of the country and the occupation of spaces that were traditionally assigned to functions 'inherent' to the city such as housing and recreation, among others, many of which were used to create market gardens and organoponics. Therefore, it is important to re-think how to plan the coexistence of traditional urban functions with the material, environmental and social benefits of urban agriculture.

Although the question of the volume of sugar cane production within the Cuban economy is still under study, there is no doubt that it continues and will continue to be the most important agricultural export product.

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Given the high degree of commitment of the rural areas to crops for export products (sugar and tobacco), the search for alternatives to food importation continues in various ways in order to ensure food security for the population. In light of this, urban agriculture should increase as a source of food for people living in cities, which cannot be achieved only by increasing the number of hectares for production, but by applying methods that are more sustainable, efficient and stable than those used during the period of economic crisis.

The improvement of alternatives such as the one mentioned above could serve to counter the danger of a new distorted and non-sustainable development, justified by the need for capital in the country. At the other extreme, since the end of 1995 and after several continuous years of acute economic decline, the beginning of economic recovery has made some people think about returning to technologies and approaches used before but which the special period had shown to be predatory, costly, provisory and, therefore, highly unstable.

Notes

1. Caridad Carrobello and Raimundo Díaz. 'Mercados Agropecuarios. Con manzanas no hay discordias'. Revista *Bohemia*, 88: 1 (Jan.5, 1996): 38–43.
2. Banco Nacional de Cuba. *Informe Económico 1994*. Havana, BNC, 1995.
3. Centro de Investigaciones de la Economía Mundial. *Investigación sobre desarrollo humano y equidad en Cuba 1999*. Havana, Caguayo, 2000.
4. Carlos Lage. 'Conclusiones de la 6ta. Reunión de Presidentes Municipales del Poder Popular'. *Granma* (Sept. 29, 2000).
5. Includes farmers from the area surrounding Havana.
6. See the related information published regularly in the daily *Granma*. In this case, the source is the issue published on April 26, 2000.
7. Aurelio Alonso and Lourdes Regueiro. *Estudio sobre la pobreza en el Caribe hispánico*. Havana, 2001. (unpublished)
8. Centro de Investigaciones de la Economía Mundial. Op. cit.
9. Juan Valdés Paz. 'Notas sobre el modelo agrario cubano en los noventa'. In *Participación social y formas organizativas de la agricultura*, Nierka Pérez Rojas et al. (comps.), 11–45. Havana: Universidad de La Habana.

Chapter II

METHODOLOGICAL FRAMEWORK FOR THE RESEARCH

This chapter summarizes the working process developed for the design, execution and integration of the research results and their socialization, as well as the approaches and tools used for the research. The chapter highlights those aspects that have special relevance and have been dealt with in an innovative manner within our context.

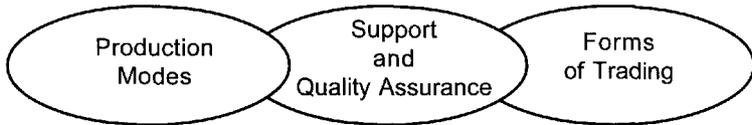
The project was designed according to the principles of participatory research in order to provide the necessary flexibility for adaptation to our specific conditions and to attain the expected objectives. Since our purpose was not to use a specific methodology or to create a new one, this chapter should not be considered as a methodological guide for other projects on urban agriculture.

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The cities in Cuba, particularly Havana, have experienced a marked development in urban agriculture over the last ten years. The scope of this development, together with the trends towards local economies that emerged in the country during the first five years of the 1990s, suggested the need to carry out research on this matter.

The manner in which this development of urban agriculture has been dealt with, including research on the subject, has privileged a sectoral approach, highlighting the technical and productive aspects, leaving aside the results and impacts of urban agriculture in the urban environment, as well as the relations between urban agriculture and environment.

The different components involved in urban agriculture present in Cuban cities have been identified, and they operate to a greater or lesser extent as a government regulated and controlled system, which includes:



This system suggested the use of a descriptive, inductive and deductive methodological model that would allow us to determine and to evaluate the impacts, results and relations of the urban agriculture with the urban environment through an inter-institutional and inter-disciplinary approach.

The logic of the research process can be seen in a general manner in the structure of the book, even though we first wanted to study concrete working areas in depth and then the development of urban agriculture in Havana, after formulating some considerations at the national level. Only after dealing with the development of urban agriculture in Havana did we proceed to study the selected areas in depth. Finally, once the potentials and restrictions of the activity in the urban environment were evaluated, we went on to propose its incorporation into the land management of the city.

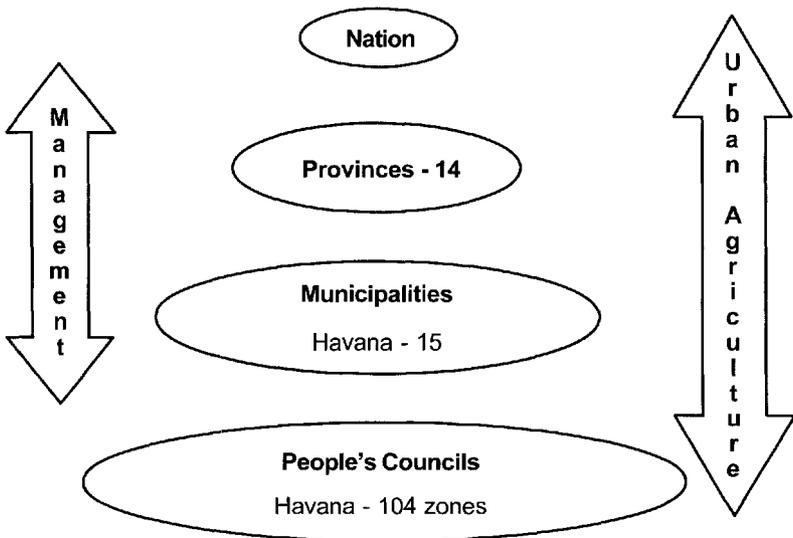
Of course, this general logic did not develop in a linear manner, because we were including feedback from various research phases and proposing new directions for the study at different stages in its development.

The research methodology applied to this project was designed and implemented with a flexibility that would facilitate the collective and progressive construction of the tools and methods to be used, the sequence of the foreseen actions, and the necessary adjustment to the expected

results. This would allow also for capacity building concerning the subject in question, as one of the ways to influence the agencies that deal with this subject and intervene in the management and control of the city.

The main objective of the research was to evaluate the evolution and possibilities for improving urban agriculture, considering its contribution to food security and the creation of a local economy. Specifically, the purpose of the research was to study in depth such issues as the introduction of urban agriculture in land management, the legal framework by which it is governed, the technological systems used and the most convenient ones. Attention was also given to the actors involved, the patterns of holding or owning the land, the way in which the producers are associated, the trading options generated by the development of urban agriculture, the use and/or re-use of water and organic waste, the role of urban agriculture in relation to filling the family food basket, gender issues and the contribution of foreign aid to such development.

Identification of the Regions under Study and Scope of the Research



The political-administrative structure of Cuba is based on the division of its land into provinces, municipalities and regions or People's Councils. These are all forms of government that are integrated in the management in both directions.

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Activities are reproduced at these four levels and in all contexts, including urban agriculture. Therefore, the study of one territory inside the city requires previous knowledge of the experiences obtained and the tendencies observed at the national level. That is why, for some of the research components, such as the local economy, the national is the first level of study.

The province of Ciudad de la Habana was selected mainly because it shows a wide development of urban agriculture and contains all the forms in which urban agriculture occurs in the country. Moreover, Havana has its own structure created by the Ministry of Agriculture and other government agencies and, given its status as the capital city, we can see the positive and negative effects generated by urban agricultural activities more clearly in this context.

In spite of being the smallest province in Cuba, the Ciudad de la Habana province, covering 727 square kilometers,¹ is the most densely populated in the country, with 2,185,076 inhabitants,² which account for 20 per cent of the total population of the country. Since the purpose of the project was to reach a high level of detail in several of its components and to include the participation of producers, field workers, government officials and others, the city and municipality scales were not recommended units for carrying out the field work because of their size, diversity and the complexity of their land base.

In light of the considerations mentioned above, a third study space was established and defined as a region, in which it was possible and necessary to find dynamic and appropriate solutions to the land base problems using local resources. The new study space or region, which applies to one part of the land base of the city, may or may not coincide with a 'zona de consejo popular', which is the territorial unit that is the basis of the grassroots government structure in Cuba.

Selection and Description of the Research Region(s)

For the selection of the region(s) under study, the following criteria were taken into account:

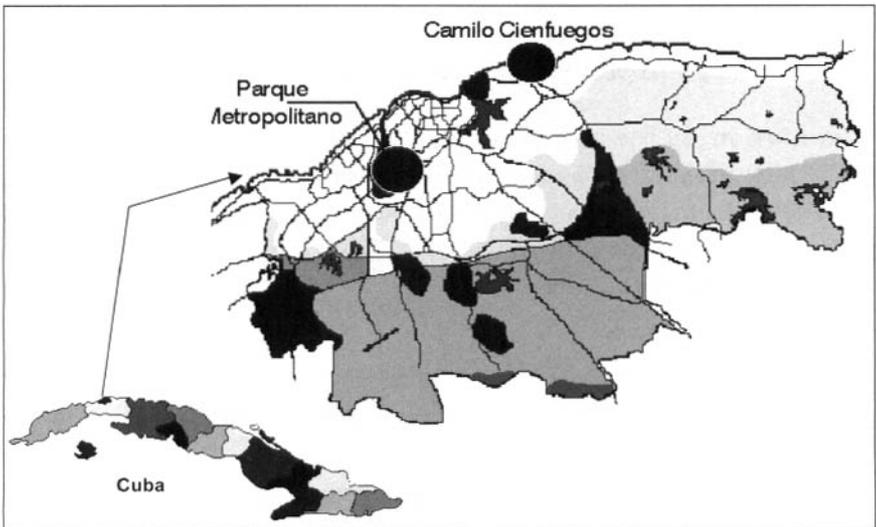
- the presence of different forms of urban agriculture existing in the city.
- the region(s) demonstrating variation in the potentials and restrictions for agricultural development.

- the applicability of the research process and results as a reference for similar work in other regions and cities in Cuba.
- the existence of other activities that drive a local economy.
- the presence of institutions, specialists, officials and/or producers who would show an interest in developing and participating in the research.

Two regions of the city that met these requirements were selected: the region of the Consejo Popular Camilo Cienfuegos (in this case, the study region coincides with the limits of the People's Council zone) and the region of the Parque Metropolitano de La Habana Project (including 9 of the People's Council zones).

It is important to note that the working team decided not to carry out a comparative study of the two selected regions, since the results would have independent value for each region.

Location of the Regions under Study



Region of the Camilo Cienfuegos People's Council

Population: 11,887 inhabitants.³ The average density is 30.1/hectare.⁴ (The highest density of the city is 449.69 inhabitants/ha in the municipality of Habana Vieja, and the lowest density is 8.38 inhabitants/ha in the municipality of Guanabacoa⁵).

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Area: 590 ha.⁶

Location: It is located in the northwest part of the city towards the central provinces. It is linked to the historic part of Havana, at a distance of 1.5 kilometers, by a rapid road and the tunnel that crosses the Bay.

The real estate development combines buildings of low and medium height and an area for new housing (not yet built), where the major agricultural production area is located, as well as the local economic activity. At the western extremity there is an important tourist centre, the Parque Morro-Cabaña, and adjacent to the east side there is a small tourist centre linked to the sports facilities built for the Pan-American Olympic Games in 1991.

There is a significant presence of urban agriculture in different forms, established more than 10 years ago and now with 124 producers cultivating land that is not very suitable for agricultural purposes.

It is interesting that, even though this is a totally urban region, its configuration is quite closed and its inhabitants live in ways similar to those of small communities.

The Parque Metropolitano de La Habana Project

Population: In the area of the Parque Metropolitano de La Habana (PMH) project there are nine regions of people's council zones but none of them is complete. The total population is 193,948 inhabitants, of whom approximately 5 per cent (9,000 inhabitants) are situated inside the project region.⁷

Area: 700 ha.⁸

Location: It is located to the east of the city. It borders the last 9 kilometers of the Almenares River, the most important river in the province.⁹

In 1990, despite the economic crisis, the PMH project was established, covering approximately 700 ha. This project is located in the far north of a green belt of existing parks where, besides the natural resources, there are houses, industries and areas dedicated to agriculture.

The PMH project requires its own economic base, according to an assessment done by the project's working group and the related workshops concerning its development of agriculture, so that it can become financially self-sustaining and thereby be stronger and better able to carry out further

actions. This financial base can gradually be complemented with support from the government and from other projects by several non-governmental organizations.

The area for the PMH project was set aside years ago to become a city park, so it already has a potential as agricultural land if a development strategy integrated to the general park project is applied. There are more than 96 producers working the area with different purposes.

It is necessary to carry out research to determine the full potential of urban agriculture while taking the park's environmental needs into account, its development as a productive function and the interrelation with other components of urban agriculture, as well as the remaining elements of the park economy. This research should be carried out on a participatory level, involving the community, the producers and other actors involved.

The Research Team

Composition of the Research Team

Once the research proposal was developed and an interdisciplinary approach chosen as the most suitable for the project, it became apparent that the research team should include representatives from institutions linked to the management and monitoring of Havana city, as well as representatives from the field of urban agriculture.

In order to form the team, the Fundación Antonio Núñez Jiménez de la Naturaleza y el Hombre (FANJ) carried out a study process with experts from some organizations already working on the subject. As a result, a group of five professionals – from FANJ, the Parque Metropolitano de La Habana, the Urban Agriculture Directorate and the Physical Planning Directorate – assumed the responsibility for designing the initial project.

This group decided that it was important for the research team to work together throughout the research process on the methods and instruments to be applied, the specific research tasks to be undertaken and the definition of priorities for each stage of the study as a way of encouraging capacity building and fostering real personal and institutional participation.

One month after the project was approved, the first project action was to hold a working meeting for the purpose of finding additional members to expand the team. As a result, the Research Team would include thirteen people (nine women and four men). Ten of the 13 members represented the institutions mentioned above; a sixth organization was added – the

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Water and Sewage Directorate – and three others were invited to participate, given their experience and work on urban agriculture. The professional qualifications of the team members covered a broad range: one livestock engineer, one forestry engineer, one geographer, one architect, four agronomists, one graduate in agronomy, one hydraulic engineer, two sociologists and one biologist.

During the second year of the project, this team was further adjusted and expanded to 15 members, seven women and eight men, retaining 73 per cent of the initial researchers and the representation from all the organizations mentioned.

The professional composition of the team changed to four agronomy engineers (one of them a producer), one graduate in agronomy, three livestock engineers, two sociologists (one of them a specialist in urban agriculture), two graduates in geography, one graduate in biology, one hydraulic engineer and one computer systems analyst (with considerable experience in urban agriculture).

The team was also supported by a group of collaborators, who were the producers in the regions under study – experienced specialists who joined the project after the research team was formed. They participated regularly in the stages of research design, application of research instruments and analysis of the data gathered. Among these collaborators were one graduate in geography, one agricultural mechanization engineer (producer), one geographer planner, one irrigation and drainage engineer, one agronomy engineer (producer) and two retired producers.

Research Team Work Process

The research team divided the work process into three stages:

First Stage: The goals at this stage were to find a common research language, to validate the objectives of the project, to define the actions that were to be undertaken during the research process, to develop and approve the research methods and instruments, to assign and carry out the different tasks and to gather the required information.

Second Stage: The data gathered was assessed. Additional research topics to be included were identified (gender), as well as those that required either further study (water for irrigation, legal framework and others) or some changes (market study for the process of commercialization). The areas that required further data were identified, the research instruments were refined and specific research tasks were assigned.

Third Stage: Evaluation and integration of the results of the work carried out in the two previous stages. Development of the document outlining project results (draft).

Assignment of Tasks Among the Research Team Members

The following tasks and responsibilities were assigned to members and the organizations represented in the group according to their technical capabilities. The task assignment exercise was also used as a methodological tool aimed at promoting commitment to the quality and scope of the research.

- a) The specialists from the Dirección Provincial de Planificación Física (DPPF) would be in charge of carrying out the soil study (capability and current and potential use) and of mapping the Camilo Cienfuegos Council region, and the reconciliation of the new results with the already existing data. It is precisely in this region where the land base used in urban agriculture practices has been subject to a proposal for new urban planning. The reconciliation of all the cartographic research information would be done during the third stage of the research process.
- b) PMH's specialists and technicians were to carry out the soil study (capability and current and potential use) as their priority and develop maps of their corresponding agricultural area. They also compared the new information with the existing data on the region in the Park archives and other registries.
- c) The research team members from FANJ were in charge of coordinating the work, as well as carrying out the interviews and assessing the results with the rest of the team. They were also in charge of keeping track of every item of documentation of the results delivered to them by the working groups of each participant organization.
- d) The research team members who would be working in their selected area (producers and agricultural extensionists) would be applying the tools designed for the research, together with specialists from DPPF, PMH and FANJ. They would also contribute their expertise and comments in order to enrich the results obtained by the other organizations and working groups.
- e) The team specialists, given their expertise in matters of urban agriculture, together with the expert from Dirección de Acueductos,

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provided their support for the collection of information on specific subjects. They also developed documents on the subject and shared their ideas in workshops, working meetings and other venues.

Chosen Research Tools and Methods and Information Analysis

The project process has combined field research with workshops and meetings aimed at analyzing the information (quantitative and qualitative analysis). This combination would result in the collective integration of the documents prepared by each of the various disciplines, member agencies, experts and collaborators involved in the working team, as well as making the necessary adjustment to the research to reflect the changes that had occurred, locally and nationally, from the time that the project was designed and approved to the implementation stage (1998–2001). Information sharing and feedback concerning this process and the subsequent results have been on the agenda of regional and international conferences and workshops.

As part of the field research, 13 experts were consulted, apart from the members of the research team and their direct collaborators. These 13 experts are from the Empresa Hortícola Metropolitana, the Dirección de Planificación Física, the Instituto de Historia, the Centro de Investigaciones Psicológicas y Sociológicas, the Grupo para el Desarrollo Integral de la Capital, the Centro de Estudios Urbanos, members of the People's Councils, and others. Interviews (370 formal and 221 semiformal) were held covering 38 per cent of producers at different times in the research process. The results were used to determine size, ranges, trends and general criteria for the application of classic statistical graphics.

It is important to note that the quantitative data arising from the application of sociological tools used in the two regions were not assumed as conclusive information on the evolution of urban agriculture, but rather were used as indicators for seeking qualitative information together with other more specific tools, and, above all, as reference items within the research process. The data collected in the interviews was complemented in turn by *in situ* observations concerning the actual use of the area, type of crops, techniques applied and other indicators.

The quantitative information in general, and at the city level in particular, was acquired by interviewing key people. In order to confirm such information, as well as that obtained from secondary sources (formal reports and other documentation), a corroborating counterpart source was always used. The rationale for this step was the need to correct and adjust,

to the extent possible, the lack of precision and incongruence resulting from the sectoral nature traditionally used to gather information on urban agriculture, as well as by the evolutionary dynamics of the field. (See table at the end of this chapter.)

As was originally designed, qualitative and quantitative analysis of the information was carried out throughout the research process. Through the application of research methods and tools, this analysis included feedback, enhancing, validation and integration of all the information.

Information sharing as well as seeking and obtaining feedback was done not only within the research team and its collaborators, but also as a chosen approach for the work process and capacity building. It was mainly applied to the organizations and communities directly and indirectly involved in the research, as well as to the members of the AGUILA research network (Agricultura Urbana en América Latina y el Caribe). The sharing of information was carried out as part of our own activities and also in events sponsored by other organizations within and outside Cuba, such as the following:

- Workshops:
 - Selecting the research team.
 - Defining and designing research methods and tools.
 - Assessing information gathered (first year) and designing the research project (second year).
 - Applying a gender approach to urban agriculture.
 - Evaluating results and project status (at the end of the second year).
 - The role of water in urban agriculture.
 - Inserting urban agriculture into land management.
- Working meetings with the participation of the research team and guests (1998–2000).
- Participation by producers, consumers, key local actors and government agencies in the stages of information gathering and preparation (1998–2000).
- Workshop of the Team for the Watershed Urban Agriculture Programme, Ecuador, attended by representatives from 28 organizations (December 1998).

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- Workshop 'Researching the Development of Urban Agriculture in Latin America and the Caribbean: Balancing and Optimizing Project Impacts' (Investigando el Desarrollo de la Agricultura Urbana en América Latina y el Caribe: Balance y Optimización de Impactos de Proyectos). San José, Costa Rica, May 1999.
- Second General Assembly of the AGUILA Network, held in Havana, attended by more than 50 people from 10 countries (November 1999).
- Seminar on 'Decentralization and Participatory Planning Methods', sponsored by the Physical Planning Directorate of Havana (Dirección de Planificación Física de Ciudad de La Habana, December 1999).
- International Seminar Towards a Sustainable Habitat: Challenges for the new Millennium', held in Havana and sponsored for the Group for the Capital City Integral Development, the Architects and Construction Engineers Union of Cuba, the National Housing Institute, and the Havana Eco-polis Project (May 2000).
- Conference on Urban Agriculture for the creation of the Mexican Branch of the AGUILA Network, attended by more than 80 people (Mexico, July 2000).
- Two workshops programmed to coincide with the launching of the Urban Agriculture Program in Santiago de los Caballeros Municipality, Dominican Republic (August 2000).
- Meeting of the Eco-villages Council of the Americas (ENA) followed by two workshops on Permaculture held in Medellín and Choco, Colombia (October 2000).
- 'Seventh Ibero-American Seminar on Urban Planning and Management', sponsored by the Physical Planning Directorate of Havana (November 2000).
- Third International Workshop on Decentralization, Research and Participatory Planning Methods, sponsored by the Physical Planning of Havana Directorate (Dirección de Planificación Física de Ciudad de La Habana) (April 2001).
- Final workshop for sharing results of the Research Project, attended by Cuban and foreign participants from the AGUILA Network and other organizations (May 7–9, 2001).

This process of sharing information and its constant validation at the field level was an essential method for the participatory and integrated analysis of the data obtained. By using this approach we were able to

include multiple viewpoints in the qualitative assessment, which would have been difficult to explain as measurements or registries, legal regulations or others. There is no doubt that the process described played a critical role in the development of this final document and the conclusions presented here.

Summary of Research Methods and Instruments

Methods and Instruments

Objectives

Consultation with experts

- To update information
- To validate results
- To obtain suggestions for topics to be addressed
- To seek general and specific guidance
- To consult on the legal framework

Formal Interviews

- To gather basic data on producers and consumers

Semi-formal Interviews

- To gather qualitative data on specific subjects
- To expand criteria for basic information on producers and consumers

Gathering of secondary information and consultation with key interviewees

- To obtain information on sales, lists of individual producers and group producers, rules and legal framework governing their work
- To update information and obtain reference materials

Quick visual diagnostics of productive areas

- To determine the actual use of the area, the types of crops, livestock, techniques applied, and the arrangements for machines, input and facilities

Workshops, work meetings and work groups

- To share information and provide/receive feedback on the state of the research
- To define methods and tools to be used in each specific case
- To train the members of the research team and engage in capacity building

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Notes

1. Dirección Provincial de Planificación Física de Ciudad de La Habana. December 2000.
2. Oficina Nacional de Estadísticas. Havana, 1995.
3. Dirección Provincial de Planificación Física de Ciudad de La Habana. December 2000.
4. Ibid.
5. Ibid.
6. Ibid.
7. Dirección del Parque Metropolitano de La Habana.
8. Ibid.
9. Ibid.

Chapter III

EVOLUTION OF URBAN AGRICULTURE IN THE CITY OF HAVANA*

This chapter not only describes the progress, achievement and deficiencies of urban agriculture, but also presents a way of evaluating it in its multiple and possible expressions, as a new function of the city. This new function has its own requirements, relations and potentials, which go beyond the production of food and capital, and should be addressed in its interaction with the other components of the urban environment.

The reader will find here the many forms of urban agriculture present in the city of Havana and will see how these have behaved and evolved over the last ten years as well as understand what, according to this evaluation, are still its main weaknesses.

This chapter also describes, although with some gaps in the existing information, efficiency indicators and comparisons within the city, which allow us to undertake a deeper analysis of the regions that we have studied and that can be used as a basis for future research.

*Yalila Murciano Guerra collaborated in the writing of this chapter.

Support and Collaboration for Developing Urban Agriculture in Havana

The development of urban agriculture in Havana started in 1989 with one important component: authorization by the local government for the people to use, free of charge, state-owned vacant lots of land in and around the city. A working commission with representatives from several institutions and from the media was also created to provide support for this initiative.

It was within this context that the government of the city asked the Ministry of Agriculture to use existing structures to provide technical support for training and motivating citizens in the agricultural management of these empty lots. The city government also arranged for the sale of botanical and agamic seeds, common tools and more than 40,000 watering cans to the population with the help of several institutions.

Another important factor was the decision taken, during the peak of the economic crisis, to assign resources and financing for building high-yield urban gardens.

Without the political will and the government's support, which has been maintained and even expanded, it would have been very difficult to achieve the level of development that urban agriculture has reached in the city.

This vital government support at the provincial and municipal levels was accompanied early on by the support of local grassroots government bodies (People's Councils) and by social organizations such as the Committees for the Defence of the Revolution and the Federation of Cuban Women. Members of these bodies acted as direct promoters of the process by replicating it in other parts of the country.

Moreover, there was also a strengthening of Cuban civil society during the first years of the 1990s. The NGOs that existed before this period were consolidated and new ones were created with new roles. Some of these organizations began to collaborate with the urban agriculture movement in 1993-94,¹ encouraging complementary interaction between government agencies and non-governmental organizations.

It is important to highlight how the process of developing and enhancing urban agriculture has not only benefited the urban environment (aside from the risks and challenges) but has also united local governments and civil society organizations. As a result, the population has a higher standard of living and has found more participatory channels of action.

This new bond between governments and communities was important, as external solidarity, historically received by Cuba in the fields of politics,

culture, science and others was directed to meet food shortages in the 1990s. It was in this context that urban agriculture became another focus of external assistance.

It has been possible to include foreign sources of financing for the development and enhancing of urban agriculture through government bodies and non-governmental organizations, which was not conceivable during the first years. This financing was initially directed to the community gardens through farmers' groups and was used to acquire basic inputs (tools, irrigation equipment, well-drilling equipment, windmills, seeds) for the development and improvement of training programs for technicians and producers.

These training programs have been instrumental in increasing knowledge and communication among all the actors in urban agriculture. Although the main responsibility for this activity is assumed by the government, it has been very valuable to have knowledgeable experts in agro-ecology, organic agriculture, permaculture and other related fields, as well as the support received through courses and workshops, the training of facilitators, the exchange of producers and specialists, the preparation of training material, resource materials and other contributions.

The collaboration in research has been mainly directed towards the productive aspects, and only recently has the research been broadened to cover other, equally important fields, such as the relations between the Urban Agriculture activities and the urban environment. It has been difficult to grasp the real value of these relations for ensuring the success of agriculture in the city.

Recently, new projects and actions have been included to introduce leading-edge technologies, such as greenhouses for the production of seedlings and for intensively grown fresh vegetables. Although these projects provide significant support for the availability of higher volumes of production and are sources of employment, they run the risk of creating a level of dependency contrary to the principles of economic and environmental sustainability, which is what we are seeking through this and other activities being carried out in Cuba.

Foreign collaboration accounts for more than 50 projects either already finished or being undertaken, involving a total of more than 2 million dollars, as well as an important number of other new projects submitted for financing. It is important to note that none of this money has been used to pay the salaries of hundreds of technicians and specialists from

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the government or non-governmental agencies that have been involved in such projects. This has been one of Cuba's main contributions to such collaboration with foreign agencies.

However, these are not the gains derived from the development of urban agriculture in Cuba, especially in Havana. The results and impact of this development and the process of improvement undergone by urban agriculture involved a high level of education for technicians, officials and producers, which in turn contributed to the dissemination of knowledge and information, as well as to capacity building.

Havana has become the centre for various meetings on urban agriculture. Many people, groups and representatives from academic and agricultural institutions come to Cuba from different parts of the world to become acquainted with our experiences in urban agriculture. Also, Cuban specialists receive invitations from all over the world to participate in conferences, workshops and regional and international projects and to collaborate with local governments and non-governmental institutions seeking knowledge for developing urban agriculture in other cities in Latin America and the Caribbean region.

What Cuba has achieved in the last ten years should be considered the basis for continued work in the search for enhancing and integrating urban agriculture within our local culture beyond the period of economic crisis in order to provide the economic and environmental sustainability needed in these times.

Direct Forms of Production in Urban Agriculture. Uses and Types of Soils

State Farms for Producers' Consumption

At the end of 1989, vacant lots outside the city and in areas previously set aside for housing and industry development emerged as state-owned plots of land to be farmed for consumption by producers.

The government handed over these plots of land, usually consisting of more than one hectare, to those labour centers that had a large number of workers and the minimum material resources necessary to achieve production in the short term for the workers' general use and consumption.

A few conditions were imposed on these users in order to keep the use of the land free of charge: no trees were to be cut and nothing was to be built, except for the necessary shelters for workers, storage, etc. These facilities should be rustic and must blend with the landscape.

The exploitation of the plots was undertaken by the workers of these labour centres on a volunteer basis for a period of time agreed upon in advance.

Each work centre produced enough roots, tubers, fresh vegetables, grains, fruits, and pork, poultry and rabbits on these state-owned lands to feed their workers, and any surplus was sold to workers in the same centre or was used to support study centres, day-care centres, homes for the elderly and facilities for newborn babies. A small amount was assigned for sale to the population around the areas of production.

The behaviour of these state-owned plots of land for consumption by producers over the ten years of study can be summarized as follows:

- By November 2000 there were 2,044 producers.

Month/Year	Number of State Farms for Producers' Consumption	Area in use (ha)	Average Yield (kg/ha)
November 1996	400	6,745	3,400
January 1999	337	4,243	6,500
December 1999	316	3,611	6,000
November 2000	292	3,086	6,100

Source: Data supplied by Empresa Hortícola Metropolitana de Ciudad de La Habana.

By comparing the years between 1996 and 2000, we can see that the number of plots decreased by 108 and the area in use went down by 3,659 hectares, or 54 per cent of the maximum area of land in use. The decrease is especially noticeable from January 1999 to December 1999, owing to an increase in the Cuban economy. However, as more people received training and more experience was gained, production gradually started to grow again.

The reduction in the number and area of plots is directly related to the temporary or permanent nature of the primary labour performed by the workers in their respective work centers and the accompanying low and medium levels of production during the peak years of the economic crisis. Once the economy started to grow again, the workers returned to their primary labour activity to meet the growing volume of work. Given the current increase in the level of production, these centres may now obtain their necessary dietary products through other means.

In our research, we have found that there is a current trend towards the transformation of these state-owned plots of land for consumption by producers. The new use of these areas varies according to their location.

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The trend in the areas owned by labour centres, when they do not want to invest in expansion, is to turn these plots into forested areas, fruit orchards and other permanent crops that require a minimum of daily labour.

When these plots are located outside of the work centres (on land owned mostly by the Ministry of Agriculture) they are handed over to municipal agricultural commissions, who determine their use. These uses can include the following:

- a) Assigning the plot to a group of farmers or to independent farmers who use the land free of charge, segmenting the area into smaller plots for consumption by those same producers, with the possibility of selling the surplus at market. This is conditional upon the farmers' keeping the area in good production.
- b) Awarding the plots of land to a group of people who request it and have formed an incorporated cooperative. This land grant is done by selection and is conditional on the optimum exploitation of the area (the authorization is withdrawn if the cooperative does not comply with this requirement) and to a pre-established use that is considered a social priority by the government. For instance, a cooperative for producing fruits, timber trees, starchy root crops, grains and fresh vegetables, etc.
- c) As an exception,² these plots can be allocated to a farmer who is making the best possible use of the part set aside for consumption by the family.

Farmers in Havana rented their farms from the state and a piece of land was set aside for the farmer's family's consumption. The rest of the leased farm went to state-run companies for raising livestock and for different crops. The plots of land that at a given time were not producing, were assigned to labour centres for the workers' use. As mentioned above, once the centres stopped using the land, the municipal agricultural commissions evaluated the areas' optimum level of use by the farmer and, according to the results, he or she was granted either part of the farm or all of it. An adjacent area could also be leased to another farmer. In such a case, the government would continue paying the rent³ even though the farmer is assigned his or her own land.

It should be taken into account that in practice the leasing of these plots of land to farmers in Havana is 'for life', a provision that remains in effect even if the farmer is no longer interested in the land. This provision has several implications, including the following:

- Leasing for life ensures that the farmers will have stable incomes even through periods of bad harvests, natural disasters and any other contingency that may have an impact on the production. It also ensures an income to the spouse in case of the death of the owner. However, in this context it is important to note that, because of the economic changes that have taken place in the country, the lease amounts, while significant at the time when they were set out, are extremely low today when compared to the income that can be generated by these plots of land and considering current market prices.
- With the exception of fruit plantations and pastures established when the Havana Belt was developed (mainly mangoes and dairy cattle), the leased land has changed in use or has passed from one hand to another with food production being the main objective. Although this is the primary aim of the people linked to the land, the farmers' culture provides a wider environmental dimension that is difficult to replace by having people working the land either temporarily or seasonally. Security, permanency and traditions are basic elements where environmental sustainability is concerned.

Although these government-owned plots of land for consumption by producers had (and still have) an important role in the food security of the workers and the people who were linked to them, it is also true that the ways in which people have used the soil for urban agriculture is considered one of the most predatory on natural resources, a fact that was aggravated by the size of the allocated lands. From the beginning, this has been greatly influenced by the temporary nature of the land use.

Aside from the conditions on which these plots of land were assigned, all the fruit trees in various work centres were completely cut down in order to plant temporary crops for certain foods. This was done without making any improvement to the soils or establishing sustainable ways of using the water. This one, among other adverse impacts on the environment caused by this type of exploitation.

In the near future it will be important to evaluate the environmental impact of the ways in which these areas (formerly used by state farms for producers' consumption) are being allocated. This is especially so when we consider the 'optimal use in which these areas should be kept', a condition that is only related to the production of food and not environmental management as a whole. Of more serious consequence is the fact they are not taking into consideration that operating in a periurban environment

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is different from doing so in the rural environment. This applies equally to other forms of soil usage that we will see below.

Community Gardens

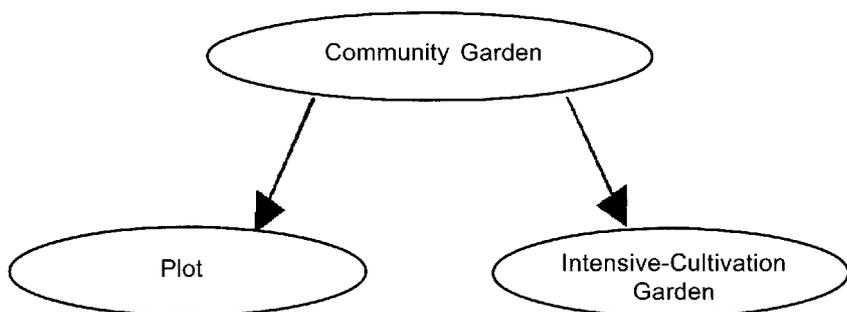
In 1991 the government of Havana engaged in an intense information campaign to motivate the population to use all the available spaces in the city for the production of food for direct consumption, thus creating the community gardens. This was a very important decision, since most of these plots were owned by the state and authorization from the government was required to use them.

Multiple uses were conceived for the plots of land and vacant lots, as well as those unexploited areas within educational or health services facilities, etc. These lots were of different sizes but usually less than 1,500 square meters and were owned either privately or by the government. They were handed over temporarily (without stating the duration), free of charge, to be worked by one or several families, neighbours, students and teachers of school centres, children and assistants in day-care centres and workers in working centres. As with private lands, these plots were planted with tubers and root crops, fresh vegetables, grains and fruits, and were also used for raising small livestock, such as rabbits, sheep, goats, and poultry for local consumption.

It is estimated that during the first years of the economic crisis (1990–94), more than 27,000 people were linked to approximately 1,800 ha.⁴ of community gardens. Although these figures have been revised down, the magnitude of this movement led the Ministry of Agriculture and the city government in 1994 to create separate official bodies that now exist for governing this form of urban agriculture at the Provincial, Municipal and the People's Council levels.

An issue that merits separate treatment is the unauthorized small-scale pig-raising activities in several community gardens. This practice, which was gradually eliminated because of the health risks involved, reached considerable proportions and expanded beyond the agricultural areas to include large buildings and houses, even in the most populated parts of the city.

The term 'community garden' has also experienced some changes over time. By the second half of the 1990s they came to be called 'Plots' or 'Intensive-cultivation gardens', according to the form of agriculture practised, the technology used, the total area available for cultivation and the destination of their production.



The name Plot was used to refer to either a state-owned or a privately owned space located in or adjacent to an urban district, usually covering a total area of less than 1,000 m², worked by one person or one family, known as *farmer*. Several small-scale crops were cultivated on these plots, and the output was used mainly for consumption by the individual or the family. In November 2000 there were 7,944 plots, accounting for 1,030.14 ha of the city and 16,869 farmers.⁵

The Intensive-cultivation garden is a state-owned or private lot located in or adjacent to an urban zone. Its area ranges from a few hundred square meters to more than one hectare, but the average lot is between 1,000 m² and 3,000 m². Fresh vegetables are intensively cultivated in beds raised between 20 cm and 30 cm (Chinese-style ridges), with more than three rotations a year. The products are intended for consumption by the producers and for trading. Intensive-cultivation gardens are farmed by one or several families or by a partnership freely formed specifically for that purpose. In November 2000 there were 221 intensive-cultivation gardens in the city, accounting for 87.26 ha and 663 producers.⁶

Community gardens in general, either plots or intensive-cultivation gardens, can be itemized as follows:

Year	Gardens	Producers	Area (ha)	Yield (kg/m ²)
1996	12,200	18,300	1,850	1–2
2000	8,165	17,532	1,117	8–12

Source: Data provided by Empresa Hortícola Metropolitana of Havana. November 2000.

Further analysis of the data above provided the following indicators:

Year	Average area per garden (m ²)	Producers/garden	Producers/ha
1996	1,516.39	1.5	9.9
2000	2,147.21	2.1	15.7

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The decrease in the number of gardens, producers and the area for cultivation is partially due to a revision of the original figures but also to the fact that many producers opted out of this activity, given the current higher availability of food traded in agricultural markets and in other forms of urban agricultural production. However, if we include the fact that the city has also used land for other purposes, we see that the supply of food coming from this form of urban agriculture has not decreased substantially. In fact, the current output is actually five times higher than that of 1996.

Despite the reduction in the total number of producers during these years (4.2 per cent), there is a considerable increase in the number of producers per garden and per hectare, owing to the fact that the decrease in the cultivated area and in the number of gardens under cultivation during the same period of time accounted for 33.1 per cent and 39.6 per cent, respectively, thus showing that a higher concentration of producers correlates with the increase in the average area per garden and the level of production reached.

The marketing of products from the intensive-cultivation gardens as well as the marketing of surplus from plots, if any, is done *in situ* or in the recently established retail outlets authorized by the Urban Agriculture Local Office and the Municipal Management Councils. Currently, Cuba has a legal framework for the marketing of these products. (See Chapter on Trading.)

Urban Community Gardens

As a result of experiences gathered in other parts of Cuba, a new mode of urban agriculture was added in 1993 – the Urban Community Garden.

The local government's aim was to allocate vacant lots between 2,000 m² and 5,000 m² in size that were not suitable for direct agricultural use to groups that would farm them collectively. Specialized institutions would provide technical assistance resources to help in preparing the land for cultivation, using rustic, recyclable materials as containers for the organic matter and agricultural soil brought from other places. The projected production was from 10 kg/m²/year to 12 kg/m²/year.

In the initial stages this form of production required a higher level of inputs and management by the municipal governments, the People's Councils and work centres. It was decided from the outset that the support of neighborhood groups and other workers was required for preparing and

cultivating these plots and that the products obtained would be for sale and for small-scale consumption by the producers.

The performance of these urban community gardens during the years indicated has been as follows:

- There are currently 672 producers in Havana using this form of production.

Month/Year	Number of Community Urban Gardens	Area covered (ha)	Average Area per garden (m²)	Average Yield (kg/m²)
1996	292	105.8	3,623.6	3.03
2000*	168	66.98	3,986.9	20.2

* Until November.

Source: Data provided by Empresa Hortícola Metropolitana in Havana.

The number of urban community gardens is now decreasing (42 per cent) as is the area used for this purpose (37 per cent). This is mainly because the initial figures have been revised down and also, but to a lesser extent, because the city has used some of the land for building other facilities.

Another reason for the decrease in the number of urban community gardens is that some were located within facilities in the city (production, service and other facilities, with the exception of those owned by the state) that have disappeared for reasons similar to those that caused the disappearance of the state-owned gardens for producers' consumption. No fewer than 47 per cent of the 292 urban community gardens existing in 1996 were located inside these types of facilities.⁷

The increase in total production, however, compensates for the reduction in the number of gardens and the area under cultivation; the food supply coming from this mode of urban agriculture today is substantially higher.

Other changes that have occurred since the initial implementation of this mode of production are related to the form of cooperative partnership and the destination of the products – mainly for market. Although we find that lots are now up to one hectare in size, the average area per unit has not changed significantly.

Marketing is carried out in retail outlets located inside the gardens. The Urban Agriculture Local Office and the Municipal Management Council must authorize the sale of products from the intensive-cultivation

gardens. Currently, Cuba has a legal framework for the marketing of these products. (See chapter on Trading.)

Raised beds with containers made from different materials (stones, pieces of wood or roof tiles and other organic materials) to retain the soil is the most commonly-used cultivation practice in urban community gardens because the lots originally had very little or no suitable soil. This is the main difference between the urban community gardens and the intensive-cultivation gardens. The potential yield projections for these types of agricultural production were 12 kg/m²/year for the urban community gardens⁸ and 15 kg/m²/year for the intensive-cultivation gardens.⁹

High-yield Urban Gardens

Another form of urban agricultural production is the high-yield urban garden (the Organopónico de Alto Rendimiento or OAR) which the government introduced in 1994 in Havana as an investment program.

The purpose was to make use of plots of land over one hectare in size, commonly not suitable for agriculture, employing human and material resources already existing in the city and specifically allotted by the government for that purpose. The size of these plots and their requirements, such as water, necessitated the involvement of specialized institutions linked to the investment processes in place in the country.¹⁰

The high-yield urban gardens were specifically designed for the cultivation of fresh vegetables and spices, mainly cooking herbs, with the potential of yielding between 15 kg/m² and 20 kg/m². The farming would be done by work centers or cooperatives that would also assume the payment for using the land and the investment costs in a mutually agreed period of time. The destination of the production would be – and still is – for sale to the population.¹¹

Six years later we have 20 high-yield urban gardens in the city, 17 of them managed by the Metropolitan Fresh Vegetable Company and 3 by other institutions. The OARs managed by the institutions cover 8.0 ha, and most of their production is intended for consumption by the producers (for instance, those managed by the Ministry of Defence). The gardens managed by the Metropolitan Fresh Vegetable Company (the Empresa Hortícola Metropolitana, EHM) cover an area of 11.1 ha distributed in 10 municipalities within the city. Production from these gardens is for sale, and five of them are selling their products to the tourism sector. The 340 people working in the OARs have maintained the original principles upon which the gardens were created.

The component that has changed, however, is the producers' manner of involvement. Currently, each garden has its own administration under the EHM (except for the 3 managed by other institutions), which is the governing body for this activity in the city. The producers are farm workers receiving a basic salary and other income beyond their salary, depending on the level of production reached and sales. The average income of the farm worker in the OAR is about 800 Cuban pesos per month, including the basic salary of 250 Cuban pesos.

Month/Year	Number of OARs	Area covered (ha)	Average yield (kg/m²)
1994*	13	19.3	12.0
2000**	20	19.1	25.0

Source: * "¿Quiénes hacen ciudad?" *SIAP Journal*.

**Until November. Empresa Hortícola Metropolitana.

The original design for a single, high-yield urban garden included several production units (one hectare per unit). This explains why in 2000 there can be seven more high-yield urban gardens than in 1994, even though the area is practically the same. These 13 gardens covered a total area of 19.3 ha even though all the units initially planned for this area were not built. Instead, seven additional OARs were created in different parts of the city.

Currently, the OARs managed by the EHM occupy an average of 0.6 ha, ranging from 0.25 ha to over 2 ha. This means that experience showed that the best results are obtained by working in smaller units, which permits higher management efficiency.

There is no doubt that among the urban agriculture production modes, OARs have had a major impact by virtue of their production volumes per area under cultivation and the supply of fresh vegetables and cooking herbs for the population at lower prices, compared to those in free markets. They have also generated an important number of jobs and have made beneficial use of urban spaces that otherwise would have remained unused.

However, OARs should be subjected to an all-encompassing and in-depth evaluation as to their production, economic, social and land-use results, as well as their environmental impact. This evaluation should be comprehensive enough to include their strengths as well as their weaknesses. It should resist the tendency to highlight only the positive aspects but should also consider the negative effects, since only with a

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complete picture will we be able to justify the implementation of any urban production activity, be it on a temporary or a permanent basis.

No actual cost-benefit evaluation has been carried out as yet nor an evaluation of the impact that the high-yield urban gardens have had on their surroundings. Such an evaluation should include the following factors:

- The real value of the urban land where they are located, an aspect that is not officially established in Cuba.
- Expenses and value related to the potable water they use.
- Transportation cost of the soil brought from other places.
- The value of recycling the organic matter generated by the city (60 per cent of the total urban waste of 1,500 mt per day).
- Transportation costs, if the production volumes had to be brought from other provinces, as was done formerly.
- Construction and maintenance costs. For instance, most of the containers are made of asbestos-cement.
- The contamination effect of the asbestos-cement when used in the production of food intended for direct consumption.
- The actual cost of basic inputs, such as seeds, biological products, irrigation systems, and the like.
- Other environmental cost-benefits that first have to be identified and which would possibly require the development of indicators to measure them.

Fresh Vegetable Greenhouses

Fresh vegetable greenhouses are greenhouse-type facilities that moderate the effects of the sun, wind and rain, and which are covered by protective screens against insects. They are intended for high-yield fresh vegetable production and the production of off-season crops.

This production mode was launched in 1998. At present there are some 70 greenhouses in operation, located in areas of the Empresa de Cultivos Varios and in Free Zones. They are tended by workers associated with Basic Units for Cooperative production (Unidades Básicas de Producción Cooperativa, UBPC) or by paid workers. Since most of their production goes to the tourism sector, the products are sold in freely convertible currency. Products not meeting the requirements of the tourism sector are sold in national currency to the general population.

The installation of fresh vegetable greenhouses is planned for areas where there are urban agriculture producers with a great deal of experience in the production of fresh vegetables. Part of the products will be for institutions and people buying with freely convertible currency, in order to permit continuity of this experience once the project is completed.

Efficiency Level of Urban Agriculture's Direct Forms of Production

The information gathered has provided an opportunity for obtaining indicators that would allow us to make a preliminary evaluation of the efficiency level of the various modes of urban agriculture practised in Havana.

The following table provides summarized data on the area covered, the number of producers involved and the average production by each mode of production.

Production modes	Area covered (ha)	Number of producers involved*	Yields (kg/m²/year)
State farms for producers' consumption	3,086	2,044	0.61
Plots	1,030.14	16,869	8.17
Intensive-cultivation gardens	87.26	663	11.91
Urban community gardens	66.98	672	20.02
High-yield urban gardens	19.1	340	25.00
Field workers	4,489	2,322 **	2.70 ***
TOTAL	8,778.48	22,910	

Source: Empresa Hortícola Metropolitana. November 2000.

* Asociación Nacional de Agricultores Pequeños (ANAP), Havana (owners and users).

** Converted from kg/ha.

*** Converted from qq/cab.

The area covered by urban agriculture's direct modes of production in Ciudad de La Habana Province (72,700 ha) accounts for 12 per cent of its land base. The aggregated figures show a ratio of 2.6 producers/ha. It is important to note that this evaluation did not include the two state-owned companies (one for livestock, the other for various crops) located in the province, which would have raised this percentage.

The table below provides estimated data on the annual production concerning each mode of production as per average yield and the area covered.

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Production modes	Estimated production (kg)
State farms for producers' consumption	18,824,600
Plots	84,162,438
Intensive-cultivation gardens	10,392,666
Urban community gardens	13,409,396
High-yield urban gardens	4,775,000
Field workers	121,203,000
TOTAL	252,767,100

Source: Empresa Hortícola Metropolitana.

If the total population of the Ciudad de La Habana province (2,185,076 inhabitants¹²⁾ and the total estimated production for urban agriculture are taken into account, the production is 115.67 kg/inhabitant/year.

Efficiency indicators for each of the urban agriculture modes

Production modes	Estimated yield (kg/ha)	Estimated number of producers/ha	Estimated production per producer (kg/producer)
State farms for producers' consumption	6,100	0.7	9,209.6
Plots	81,700	16.4	4,989.2
Intensive-cultivation gardens	119,100	7.6	15,675.2
Community urban gardens	200,200	10.0	19,954.4
High-yield urban gardens	250,000	17.8	14,044.1
Field workers	27,096	0.5	75,751.9

Source: Empresa Hortícola Metropolitana, November 2000.

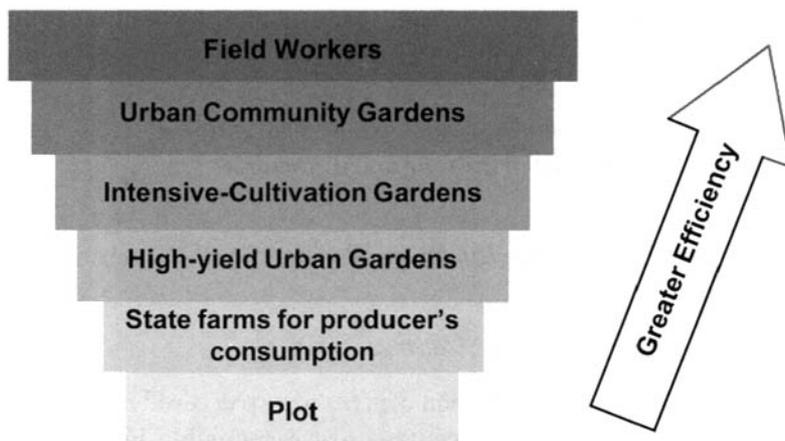
With the purpose of defining a single scale for urban agriculture's various modes of production, we considered that those producing higher yields, requiring fewer producers per hectare and having higher production levels per producer were the most efficient modes. We established a value range from 1 to 6 (from lower to higher levels of efficiency) for each indicator.

After that, we added the values reached for each indicator in each production mode and, as a result, we obtained a value that qualitatively reflects the efficiency level. The highest value corresponds to the highest level of efficiency.

The basis for this analysis is to regard the three initial indicators as equal and to estimate them at the starting point only by the number of producers, their production and the total area. That is why this analysis should be considered as an initial approach to this important topic, which should be further evaluated in depth after the efficiency indicators (energy, economics, biological and environmental indicators) have been included. The following table and graphic reflect, respectively, this analysis and the efficiency ranking of the production modes.

	Yield/ ha	Producers/ ha	Production/ producer	TOTAL
State farms for producers' consumption	1	5	2	8
Plots	3	2	1	6
Intensive-cultivation gardens	4	4	4	12
Urban community gardens	5	3	5	13
High-yield urban gardens	6	1	3	10
Field workers	2	6	6	14

Ranking according to efficiency



As shown above, the highest levels of efficiency correspond to field workers, urban community gardens and intensive-cultivation gardens, in this order, without a significant difference among them, which, to a certain extent, correlates with the method used. However, there is a marked difference between the most efficient modes and the least efficient ones.

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It is interesting to observe that, although the OAR is the production mode with the highest yield per area, it is not the most efficient one, mainly because of the high number of workers that it requires, while the plot is at the lowest level of efficiency mainly because of the low average yields.

Although the substantial development of urban agriculture in Havana arose from the need to produce food as a response to the acute economic crisis, we must remember too that other problems, such as unemployment, were exacerbated as a result of this crisis.

However, the need to practise this form of agriculture on organic bases, with no trained personnel and in small lots, requires intensive use of manpower. But as we now need to enhance the development of this activity, it would be appropriate to reconsider the number of workers per hectare as a way of reaching higher levels of efficiency.

Also, more work should be done on those matters that would help increase production in plots. Even if this mode of production does not account for the greatest contribution in terms of sales, it is evident that it does produce significant amounts of food.

As mentioned elsewhere in this study, an important incentive for keeping the plots' mode of production running, rather than abandoning it in favour of a market-oriented mode of production, could be to have producers achieve higher yields using similar amounts of resources, work and time. This would require special attention by the management structures of urban agriculture and by other bodies linked to this activity for the provision of additional training and the adoption of more appropriate techniques.

Support for Urban Agriculture Production. Types and Uses of Soil

Organic Matter Production Centres

The organic matter production centres are structured as UBPC and were created in 1999. These centres are responsible for collecting, processing and distributing organic matter to all the urban agricultural production modes in the city and, especially, to the OARs.

In Havana there are now 12 UBPC for organic matter in various municipalities in the city (with the exception of the 3 central municipalities, Habana Vieja, Plaza and Centro Habana)¹³ and a national reference organic matter centre located in the Instituto de Investigaciones Fundamentales de la Agricultura Tropical (INIFAT). There are also several minicentres for compost production operating within production units and other

research centres. The latter mainly process the organic matter that they generate.

However, although no information is available concerning the volume of production in these centres and minicentres, experience shows that their production is not adequate to meet the needs of the city. This is clearly seen in the resulting deterioration of the soils and the demands of producers that are not met, among other adverse impacts to be addressed later.

Besides their production and commercial functions, these centres are in charge of coordinating, monitoring and assessing activities related to organic matter in their areas of operation.¹⁴

These UBPC are self-financing bodies, and the income of their workers depends on their sales. Each UBPC covers approximately 1 or 2 ha of land and employs an average of from five to six persons.

The organic matter that they use for the production of organic compounds comes from the dairy farms located in municipalities outside the city, from the collection of plant residues in agricultural markets and from large-scale agricultural production (for instance, the husk of rice). However, the city produces approximately 1,500 mt/day of waste, of which about 60 per cent is organic waste,¹⁵ and currently only 15 per cent of it is been used,¹⁶ leaving a unused potential that could help to reduce management and transportation costs and provide benefits to producers and the city in a more general way, without causing an adverse effect on other production ecosystems.

Agricultural Information Offices

These offices were created in 1991 by the Ministry of Agriculture and the government of the city in order to meet the needs of technical assistance to some extent and to support those who were starting activities as urban producers. There was approximately one office per municipality, located either on the premises of the engineer or technician in charge of the area or in a small place equipped for this purpose.

Besides the technical assistance, these offices promoted seed and seedling exchanges, facilitated the flow of information, and organized meetings with producers for discussing experiences and exchanging ideas, free of charge.

As the number of urban producers started to grow, the ways of providing them with assistance for agricultural production was improving and, gradually, during this process the agricultural information offices became

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the Agricultural Support Stores (Tundas Consultorios Agropecuario, TCA), of which there are currently 29 in all the municipalities of Havana. Each of these stores, according to the municipal demand (a higher number of producers and/or agricultural area) has between one and three extensions operating in a permanent or a temporary location in the area. The total number of stores including their extensions is 41.¹⁷

The role of these agricultural support stores and their extensions is to provide technical assistance to urban producers and to provide them with seeds and seedlings, biological products, and veterinary medications and products, agricultural tools, bio-soil, earthworm humus, ornamental plants, brochures and specialized literature. They also offer assistance services concerning plant health, animal health (to a lesser extent) or on other related issues, either on their premises or on the producer's premises.

Both the stores and their extensions are self-financing and they charge for the provision of services. They also sell the products mentioned above. The profits they make are used for paying salaries and buying agricultural input, seedlings and other products from government stores and private producers. The monthly income of the workers depends on the sales and the services rendered. Each of these stores and their extensions is under the care of three workers on average, and 60 per cent of them are women.¹⁸

Representatives from the Ministry of Agriculture and the People's Council may be involved in the TCA sales through their relations with producers and according to the producers' requirements. They are paid on commission for their involvement in sales and in this way they supplement their incomes.

Even though no doubts remain about the important benefits that the TCA and their extensions provide to producers (products and input) and also to the people directly and indirectly linked with them (income), be they workers or suppliers. They may be promoting dependency on this system in some respects, such as, for instance, the supply of seeds, seedlings, sanitary products and bio-formulas, a dependency that will restrict the development of a more sustainable process for seed production among producers or systems that are self-regulating from the ecological point of view.

Seedling Greenhouses

Seedling greenhouses (Las Casas de Posturas, CP) for the production of seedlings started to operate in 1996 as part of a project financed by

AgroAcción Alemana (AAA). Their objective is to produce high-quality seedlings for all the existing agricultural modes of production in the city.

The seedling greenhouses sell their products through agreements arranged directly with producers (urban community gardens, field workers, farmers, and others) requesting their products. They also sell to agricultural support stores.

Currently, there are 11 seedling greenhouses located in eight municipalities in the city.¹⁹ Workers in the seedling greenhouses are associated as UBPC.

Each of these facilities covers about 0.25 ha, of which 50 per cent is built. They use an anti-aphid screen as a crop protection system and produce mainly seedlings for vegetables and, in lower volumes, seedlings for high-quality fruit trees. They use biological means for sanitary controls as well as certified organic compost and bio-soil from the organic matter production centres. Installing a seedling greenhouse costs US\$25,000, including the drip irrigation system.

Both the anti-aphid screens and the trays where the seedlings are produced (ridging system) are imported. That is why financial support is needed to continue with these greenhouses once the project that initiated them is completed. Otherwise, this form of support to urban agriculture risks disappearing for lack of financial sustainability.

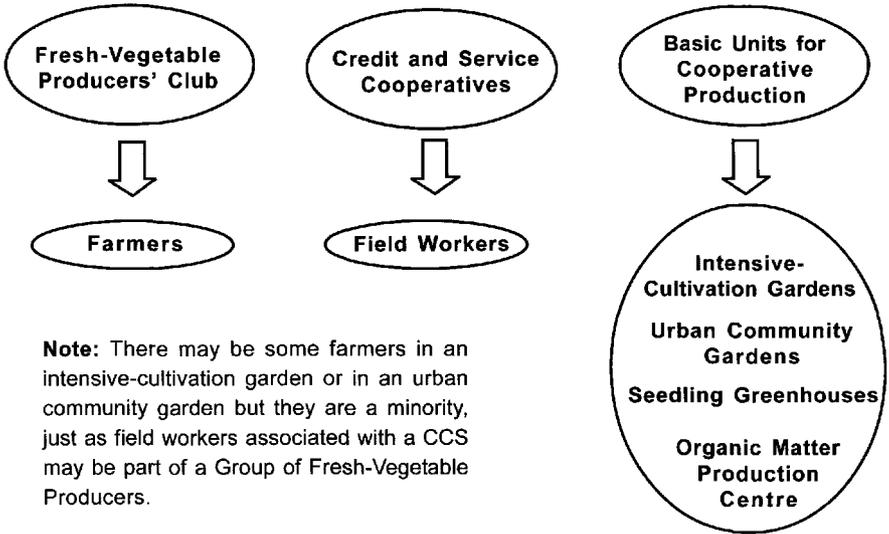
Apart from natural adverse conditions that may affect this type of facility, another limitation identified is the availability of water for irrigation, subject to the approval of the Instituto Nacional de Recursos Hidráulicos.

Partnership Modes Among Producers

Farmer Groups

The fresh-vegetable producers' clubs appeared in the early 1990s, when urban producers located in the far northwest end of the city spontaneously started to form partnerships with the purpose of sharing experiences and finding better self-managing capabilities. The positive results obtained with this new form of community participation prompted the Urban Agriculture Directorate to extend the experience to the whole city in order to establish the necessary communication links throughout the system.

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Note: There may be some farmers in an intensive-cultivation garden or in an urban community garden but they are a minority, just as field workers associated with a CCS may be part of a Group of Fresh-Vegetable Producers.

The main elements that first connected these Clubs and helped them to develop were training activities and the sharing of experiences. Producers then had access to agricultural input sold or handed out in Cuba or input from abroad in the case of projects that started to develop with external financing. Today these fresh-vegetable producers' clubs are called *Farmers' Groups*.

Year	Total number of plots	Producers	Groups
1996	12,200	18,300	813
2000	7,944	16,869	850

The number of farmers' groups currently registered in the city is 850. This figure has increased since the first clubs were created even though the number of producers and the area covered have decreased over time. This is a clear sign that the farmers' groups are stronger irrespective of the number of participants involved. The average number of producers per group is between 15 and 20.

Despite the fact that they may be using state-owned land, the farmers' groups are independent bodies, and they are recognized as such by all the institutions. They receive assistance from the urban municipal farms, and the land they use is registered in the Land Registry Bureau of the urban agriculture municipal group of the municipality where they operate. However, they are not legally incorporated, which, to a certain extent, is a weakness in the urban agriculture system.

Agriculture-Livestock Production Cooperatives and Credit and Service Cooperatives

The agriculture-livestock production cooperative (Cooperative de Producción Agropecuaria, CPA) is a partnership mode, created in Cuba in 1976, whereby farmers voluntarily join their lands and production means and organize a collectively-managed operation. In Havana there is only one CPA; it is devoted to sugar cane crops and is not included in this study.

At the beginning of the 1990s another CPA was formed with farmers and land users in the area of the Parque Metropolitano de La Habana (PMH) project, but this cooperative failed. (For more information on this subject, see the chapter on the Parque Metropolitano.)

The Credit and Service Cooperatives (CCS) emerged in Cuba in the 1960s²⁰ as a farmers' partnership mode. They are legally incorporated, which allows them to extend credits and provide services to their members. Farmers organized in CCS keep their land separate and undertake to meet the commitments of internal by-laws that they have drafted and approved. In order to maintain Cuba's equity principles and other social priorities, the farmers who are members of the CCS establish agreements with the government whereby they commit themselves to hand over to the state about 5 per cent of their production. They can sell the remaining 95 per cent as they wish.

Havana currently has more than 2,000 farmers, located mainly in the immediate outskirts of the city, covering an area of 4,489 ha and growing various crops, with farms of between 3 and 13 ha. Approximately 3 per cent of these farmers are within the urbanized area, in plots of up to 3 ha in size. Their activities cover the cultivation of several crops, the raising of small and large livestock, and the growing of flowers and ornamental plants.

In the 1990s, when urban agriculture started to be developed as a result of the economic crisis, the farmers in Havana, who were already organized in Bases Campesinas de la Asociación Nacional de Agricultores Pequeños (ANAP), changed to the CCS partnership mode. Currently, there are 48 CCS and all of them are considered part of the urban agriculture sector.

These partnership modes bring producers the following benefits, among others:

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- Incorporation as a legal entity to simplify legal procedures, since a corporate body can be processed more expeditiously than a number of individual applicants.
- Options to facilitate the sale of their products, either on their own premises or in agriculture-livestock markets.
- Priority for acquiring agricultural input, seeds, irrigation equipment, fuel and the like, since the state-owned companies give priority to CCS in this respect.

Of all the production modes existing in Havana, CCSs are the highest contributors of urban agriculture to food security for the population. It is believed that this activity represents approximately 60 per cent of the total agriculture-livestock production in the city.

During these years, because of the economic crisis in Cuba, farmers have been gradually recovering traditional production practices, which have been reinforced by the efforts of the Urban Agriculture Municipal Directorate to provide training and to direct farmers towards agro-ecological forms of production. However, CCS can still buy chemical products (fertilizers, insecticides and pesticides). The supply of these products in terms of volume is significantly lower than in past decades and is used mainly for specific crops such as garlic, onions and flowers.

This practice may delay the transition towards more ecologically sound agricultural practices and makes it possible to foresee the risk that producers might revert, in times of better economic conditions, to using agricultural methods that are dependent on chemicals and cause damage to the environment.

Basic Units for Cooperative Production

The UBPC emerged in Cuba in 1993 as part of the decentralization process of the agriculture-livestock government operations. Steps towards a partial decentralization of management had been taken before within the predominantly state-owned land property system. However, the beginning of a real structural change in the agriculture-livestock production system came only with the crisis in the Cuban economy in the 1990s.

The UBPCs were created when the government handed land over to people free of charge on a permanent basis, usually to field workers interested in forming a partnership as an agriculture-livestock cooperative. The plots vary in size and the members control the property, which is

their heritage and also their livelihood. The members also deal with accounts and bank loans. As required by their operations, they elect a President and a Board of Directors. Currently, 36 per cent of the agricultural land in Cuba is managed as UBPCs, according to information supplied by the National Television News Report on December 15, 2000.

In order to form a UBPC in Havana, a group of people (family members are not excluded) get together and submit an application to Comisiones Agrarias Municipales (the Municipal Agrarian Commission). The UBPCs are legally incorporated bodies that operate as economic units. They buy the products and input needed for their operations and have the option of insuring their harvests. In order to apply for loans to the Banco de Crédito y Comercio (BANDEC) or to Banco Popular de Ahorro, they must have the endorsement of the Empresa Hortícola Metropolitana. UBPCs are subject to audits and must submit reports on their operations at regular intervals.

Authorizations to operate granted to UBPCs are conditional upon their making the best use of the land (if the land is not in operation, their authorization is withdrawn). The line of business is determined by the government according to social priorities. For instance, there are UBPCs for fruit trees, timber trees, starchy crops, grains, organic matter, fresh vegetables and so on.

In Havana, UBPCs are operating intensive-cultivation gardens, community urban gardens, seedling greenhouses, fresh-vegetable greenhouses and organic-matter production centres, but not high-yield urban gardens or agricultural support stores.

UBPCs in Cuba constituted one step towards the implementation of a more democratic and participatory production system. In Havana there is a marked level of subordination to the local offices of the Ministry of Agriculture. This dependency tends to restrict the possibility of creating a stronger and more permanent bond between producers and the land and agricultural activities. It also tends to restrict their creativity. Addressing these and other issues may help to generate more sustainable practices for the urban environment.

General Considerations

The Benefits of Urban Agriculture

The specific results of the evolution of urban agriculture in Havana and, in some respects, in the country as a whole have been explained thus far. However, other more general findings and trends also emerged from this research study and these deserve attention.

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Apart from the problems associated with the sustainability of urban agriculture, this practice in Havana has had a very positive environmental impact:

- Availability of food, mainly fresh vegetables and cooking herbs, reaching production figures of between 150 and 200 g/per capita/day.²¹
- The guarantee to consumers that they are buying healthy agriculture-livestock products grown without agro-chemicals or, as in some of the urban agriculture modes, with a very limited use of agrochemicals.
- Even in cases where the official authorization for using land for agricultural purposes is only temporary, a substantial number of vacant lots in the city are being used productively, thus significantly increasing the green mass in the city.
- Most of those vacant lots in the city that had become minidumps during the first years of the acute economic crisis were no longer used as dumping grounds but for agricultural production.
- The current difficulties for providing public services (for the crisis is not yet over) would have worsened the sanitary conditions in the city had the process of development and enhancement of urban agriculture not occurred.
- There is a significant level of recognition of urban agriculture and of its contribution to an agricultural culture among the citizens, especially among children and young people, who can identify at least one of the several modes in operation and admit that is compatible with the urban environment.
- The number of jobs generated by urban agricultural activities in Cuba is estimated to be around 100,000.²² No information is available concerning Havana, but it is clear that a large number of people are employed mainly in the high-yield urban gardens, community urban gardens, intensive-cultivation gardens, seedling greenhouses, agricultural support stores and fresh-vegetable greenhouses, and in the associated supporting and monitoring services.
- The development of urban agriculture has involved many actors, which is uncommon in other production or service sectors.

People involved in urban agriculture activities are producers, technical assistants, leaders and support personnel. Men usually work as producers and women as technicians. Children, young people, adults and senior citizens are also involved, regardless of their educational

level or occupational categories (housewives, workers, technicians, medical doctors, engineers, retired people, soldiers and others). This diversified sample shows the high level of involvement in this activity.

A similar pattern of diversity is found among the actors involved in growing different crops. There is a rich variety, which benefits the environment and promotes a nutritional culture, including changes in bad eating habits left over from the colonial period.

Diversity can also be found in the many urban agriculture production modes—community farms, community urban gardens and high-yield gardens, which provide a broader level of support for the people's involvement and contribute, aside from the problems addressed in this document, to breaking the monotony of other activities inserted in the urban landscape.

- On the other hand, Cuba has been characterized historically by large plantations (mainly sugar cane), large landed estates, vast ranges for grazing, a small number of farmers (compared to other Latin American countries) and, in its more recent history, by the presence of large state-owned companies and a high level of mechanization and input. These conditions have been instrumental in shaping the Cuban's way of thinking, acting and believing.

Even though it is not possible that urban agriculture alone can meet all the food requirements of a city or a country, one of the impacts of this practice is associated with changes in the traditional thinking patterns and beliefs mentioned above.

Urban agriculture has demonstrated in practice, over ten years, that in small and diverse lots of land a considerable volume of food can be produced and, moreover, that this can be done using local resources and applying the most appropriate techniques. Urban agriculture has demonstrated that other important categories or scales for agricultural production exist, which becomes even more significant in the context of a long and narrow island. This experience is also an example for other forms of production at the local level.

Notwithstanding the foregoing, there still are components yet to be re-evaluated within the enhancement process of urban agriculture that is taking place in Havana. This re-evaluation should not be done separately from the other processes that are taking place in different sectors in Cuba in the search for a more just, equitable and committed society. Involvement of the government and every citizen, will ensure

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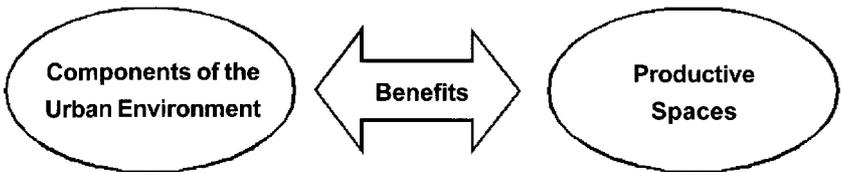
that future generations inherit an environment that is better than the one we currently live in.

If urban agriculture fails to establish a direct relationship with the urban environment and restricts its operation only to a production activity aimed at food security and nothing else, it will always be a very vulnerable activity running the risk of disappearing.

The Main Weaknesses and Problems in the Urban Agriculture–Urban Environment Relationship

The following problems concerning the relationship between urban agriculture and the urban environment need to be corrected:

1. The existing design does not favour harmony between the productive space and the constructed space, not only aesthetically, which no doubt is an important factor in any working environment, but also in relation to other components of the urban environment – be they natural, economic or social. What is required is a design that produces benefits in both directions and on different scales (area, neighborhood, zone, municipality, city).



This design, which to a certain extent is carried out within the boundaries of the production area, should go beyond that space to take into account the zone in which it is located. Furthermore, the interests of producers and those of the rest of the citizens, not directly associated with the results and impacts of the production activities, should be considered in a participatory manner.

2. Insufficient research has been done concerning the adverse impact that the establishment and management of any of the urban agriculture modes may be having on a particular place in the city. In the case of Havana, as one of many examples, there is little information concerning the amount of toxic elements that may be present in the leafy-green vegetables if crops are located in places with a high motor-vehicle concentration.
3. Urban agriculture needs to be enhanced, not only in terms of higher yields, trade mechanisms and management systems, but also in terms

of increasing the quality and efficiency of those mechanisms. A broader evaluation of the cost-benefit ratio of this production activity in each of its different modes is also needed; otherwise, the level of subsidies would force a reconsideration of its feasibility with the risk of losing all that has been achieved and the values that have accrued.

4. In some respects, urban agriculture and rural agriculture are alike in that they both use the same instruments, indicators and partnership modes. However, their environments and scales are different as are the actors involved. That is why urban agriculture requires its own conceptual framework, which should go beyond a given typology or classification in use. Examples of this are the following:

- The only difference between an intensive-cultivation garden and an urban community garden is that one of them has containers and the other does not.
- A plot with different crops might have a more organic management system than an urban community garden (*organopónico*) has.
- Not using agrochemicals does not necessarily mean that the production is organic.
- Conducting organic activities does not mean that they are sustainable.
- Unlike rural producers, not all urban producers are devoted exclusively to agriculture. Therefore, the level of training and monitoring they require should have specific features.
- The governing system for UBPCs, for instance, is not well suited to productive units employing only three or four workers, as is frequently the case in urban agriculture.

In the urban agricultural sector as currently practiced in Havana, management and training concerning diseases and pests, soils, and the value of the urban soil, among other subjects, are addressed and discussed, generally, in the same way as those of rural agriculture. This is also true, with the exception of Farmers' Groups, for the different authorized partnership modes.

Therefore, the responses, results and impacts may not correspond to the actual requirements of the urban environment in which they operate, which leads to further disregard of limitations as well as waste of the potential of both the urban environment and urban agriculture.

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5. In Havana, 38 per cent of the water for irrigation now comes from the public water system, 29 per cent from wells (underground water), 28 per cent from reservoirs; only 4 per cent ensures water supply for two means of irrigation and, lastly, 1 per cent is transported to production areas by tank trucks.²³ It is clear that obtaining and storing water within the production units, and also reusing water on different scales, are not being given the attention required.
6. Organic matter for the different modes of urban agriculture is transported directly from the livestock facilities, sugar processing centres (which need it for their own soil and which require transportation), markets and other places. All of this implies costs and dependency, but what is worse, it creates imbalances in other systems.

Unfortunately, the possibility of establishing small-scale relations with the community for the use of organic waste is not being properly considered. This could be an opportunity to make a source of organic matter available, educating citizens and fostering a culture of recycling and maximizing the use of local resources, at the same time reducing the cost of organic matter for agricultural production.

7. The urban agriculture system in Cuba, and Havana in particular, has all the communications means available to disseminate information, provide training and promote this activity. However, the current focus is on the production function, disregarding the possibilities of having a more comprehensive impact on the enhancement of this practice so that producers, technicians and the general public may come to have a new view and way of behaviour concerning urban agriculture.
8. On the other hand, if those who are involved in urban agriculture – technicians, decision-makers, officials and all those who in some way participate in this complex environment – are not taking into account the environmental dimension of this activity or its relationship with other related components in the city, it will be impossible to ensure its real economic, social and environmental long-term sustainability by other means.

This context determines the need for working in such a manner as to involve the largest possible number of disciplines and all those bodies responsible for the management and control of the city. But those

directly involved with urban agriculture require more comprehensive training based on the city's needs in general and not particularly from the agricultural point of view. The environment as a subject should be the supporting component of this type of training.

9. Producers who have no assurances of their permanent use of the space where they operate will give priority to securing products and capital that they can use in the short and medium terms. They will not engage in actions (to the extent needed) aimed at guaranteeing environmental sustainability, because 'the future' is not their problem. This behaviour can be seen among producers who have an agricultural culture and even more so among those who do not, as is the case with the majority of urban agriculture producers.

Local and international experience indicate that even several years of accumulated experience are not enough to change economic, social and land-ownership behaviours and thinking patterns. That is why neither the term 'environmental awareness' nor the term 'training' is enough to change attitudes and actions in any sector of the society. It is necessary to generate other associated means without distorting the main elements that support the development system chosen for a particular country.

In order to act on this issue in Havana, it is necessary to promote the following:

- More autonomy and participation by the producers in actions and regulations governing urban agriculture.
- A higher level of correlation between the proposed objectives in the partnership modes and their practical application.
- A significant increased involvement of producers and citizens in general in land management planning, especially at the zone level.
- A higher level of commitment in the handing over of land, both by producers (for environmental management) and by land owners (for securing permanency to producers either outright or for an agreed-upon period of time).
- On-going assistance, implementation of monitoring and control systems aimed at building capacity at the technical and production levels, so that the creativity of producers and technicians involved in urban agriculture may be used and developed to its full potential.

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- Regulations and control structures designed for urban agriculture should avoid reinforcing the complexity of the process and address only such matters as the quantity of food and/or capital, either produced or to be produced.

The Technological Systems Used

The subject of the technological systems currently being applied in urban agriculture in Havana is important and requires a more thorough consideration.

The mass media portray urban agriculture in Havana and in the other Cuban cities as 'agriculture on an organic basis'. The justification for applying this concept is that agrochemicals are not used (or only in minimal amounts), that bio-formulas, crop rotation and association are employed, together with draft power, mainly in the peri-urban zones, and organic matter for the soils.

It is clear (and it is a significant achievement) that these conditions determine the production of 'healthy' food and that the use of agro-ecological techniques on such a massive scale is hard to find in other countries in the region. This behaviour is based on the following:

- a) A study concerning the research on biological products and its production that was carried out over many years by research centres of the Ministry of Agriculture and the national universities.
- b) The lack of financial means to acquire agrochemicals, machinery, spare parts and fuel, among other inputs, as a result of the acute economic crisis that has been facing Cuba for more than ten years.

However, without reiterating the urban characteristic of the agriculture under study and restricting this analysis to the production activity, it is necessary to point out that the use of organic agriculture techniques and, taking the point even further, of those of ecological agriculture is more integral in scope than the techniques applied in our cities. The bases for this evaluation are the following:

- Although the minimum conditions to be met for locating operations for some modes of urban agricultural production were set down, their design had been preconceived without taking into account all the conditions and requirements of the location selected.
- Techniques are applied in many cases with preconceived ideas, failing to take into account the biological, economic and cultural components

of the location of the operation and the actors involved. The fact that there is a single evaluation and follow-up system, known as agricultural subprogramme, confirms this finding.

- When this concept is applied to other modes of urban agriculture, producers have to access these technologies by means of subsidies and/or donations and change the space to accommodate the technology applied. As a result, the local resources are not properly identified or used, thus jeopardizing the environmental and economic sustainability of the system.
- Some of the technologies being used are not taking full advantage of local resources and are dependent on external input from other ecosystems, producing an imbalance in those systems and increasing costs. One example of this concerns organic matter.
- Support technologies, such as seedling greenhouses, agricultural support stores and organic matter production centres, are part of a quality assurance system for agricultural practices in the city, However they also promote producers' dependency and tend to restrict their ability to find solutions by their own means or through local support networks, which are less susceptible to changes in policies or in economic conditions.
- The most relevant example is that, while producers identify the supply of high-quality seeds as one of their most important unmet requirements, they do not usually engage in practices to select or produce their own seeds or recover native germoplasm.²⁴
- Biological diversity is addressed within a restricted framework, mostly in specific production purposes. For example:
 - Crop rotation and association are managed within the same group of plants; for instance, in the urban community gardens, rotation and association are applied mainly between fresh vegetable crops.
 - Livestock producers, even when raising more than one species, do not create an integrated animal-vegetal system that would consider fodder, grains and trees as an important part of that system. However, they managed to establish a productive cycle in which, for instance, excreta and food residues are used as organic compost.²⁵

It is important to note, as well, that during these ten years of massive development of urban agriculture in Cuba there has been in place an important training process in organic agriculture, ecological agriculture

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and other forms directed to producers in general. Production levels have improved and so have the distribution channels for biological products. Important campaigns for planting timber trees and fruit trees have taken place. All these efforts are aimed at a gradual transformation towards modes of agricultural production that are more sustainable from the environmental perspective.

However, as already mentioned, ten years is not enough time to change behaviours that have been conditioned by production systems (based on the use of agrochemicals and mechanization) established for more than 40 years. One example in this context is the use of biological products. Currently, and apart from the fact that bio-formulas in Cuba are much cheaper than in any other country in Latin America, the trend among most producers is to give preference to agrochemical products. They argue that the effects of biological products are seen in the longer term and they need short-term results for their products. They also know that in order to fix the biological products in the soil many applications are needed, which increase the costs.

Two issues deserve more attention and further research. The first has to do with improving the agricultural extension work with the purpose of achieving a more comprehensive management of the production areas and, especially, land or agricultural soil management. The use of bio-formulas would then diminish over time and such dependency, as harmful as any other, would be avoided.

The second issue has to do with research into the long-term use of any product, even if it fits within the biological parameters, since its management and frequency of use are going to generate impacts that require evaluation.

Notes

1. The Departamento de Coordinación y Asesoría de Proyectos (DECAP) of the Cuban Council of Churches (Consejo de Iglesias de Cuba) initiated the first project with the Santa Fe Horticultural Club, Playa Municipality, in 1993.
2. As per decision by the Empresa Hortícola Metropolitana.
3. This type of leasing started in the mid-sixties with the promotion of an agriculture-livestock plan called Cordón de La Habana (Havana Belt). See Chapter VIII.

4. María Caridad Cruz Hernández, 'Agricultura Urbana. Una experiencia de aprovechamiento de los espacios disponibles en la ciudad de La Habana'. Paper presented at the 28th Conference of the Caribbean Studies Association. Kingston, Jamaica, 1993.
5. Data provided by Empresa Hortícola Metropolitana.
6. Ibid.
7. María Caridad Cruz Hernández, 'Agricultura Urbana y medio ambiente: Ciudad de La Habana'. In *¿Quiénes hacen ciudad? Ambiente urbano y participación popular: Cuba, Puerto Rico y República Dominicana* (Cuenca, Ecuador: Ediciones SIAP, 1997).
8. —, 'Agricultura Urbana en América Latina'. In *Memoria del Seminario Taller Latinoamericano sobre Agricultura Urbana. Celebrado en La Paz, Bolivia, April 24–26, 1995* (La Paz, 1997): 198–205.
9. Instituto de Investigaciones Fundamentales en Agricultura Tropical, Grupo Nacional de Agricultura Urbana, *Manual técnico de organopónicos y huertos intensivos*. Ministry of Agriculture, Havana, 2000.
10. Instituto Nacional de la Reserva Estatal. Programa para la construcción de Organopónicos de Alto Rendimiento en Ciudad de La Habana. Havana, 1994.
11. María Caridad Cruz Hernández, 'Agricultura Urbana y medio ambiente: Ciudad de La Habana. Resultados de un proyecto de investigación de la Sociedad Interamericana de Planificación 1994–1996'. *Revista Interamericana de Planificación*, XXIX: 115–116 (1997).
12. Oficina Nacional de Estadísticas. Havana, 1995.
13. Data provided by Empresa Hortícola Metropolitana.
14. *Los centros de material orgánica en la agricultura urbana*. Havana, Instituto Nacional de Investigaciones Fundamentales en Agricultura Tropical, 2000.
15. Empresa de Recuperación de Materias Primas de Ciudad de La Habana, 1998.
16. Mario González Novo, 'Institucionalización de la agricultura urbana en Ciudad de La Habana'. Paper presented in the Regional Seminar 'Agricultura Urbana en las Ciudades del Siglo xxi'. Quito, Ecuador, April 2000.
17. Representatives of the Provincial Group of Urban Agriculture in the research project.
18. Personal communications by representatives of the Provincial Group of Urban Agriculture in the research project.
19. Ibid.
20. Juan Valdés Paz. Personal communication. The development of the cooperative movement in Cuba was promoted in the sixties by ANAP, Asociación Nacional de Agricultores Pequeños (National Association of Small Producers) and as the official cooperativization policy in the second half of the sixties.
21. *Granma* [Havana], April 26 and July 31, 2000.

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22. Ministry of Agriculture, *Lineamientos para los subprogramas de la Agricultura Urbana para el año 2000*. Havana, Agroinform, 1999.
23. Mario González Novo, 'Institucionalización de la Agricultura Urbana en Ciudad de La Habana'.
24. Reports on Permaculture workshops and courses coordinated by the Fundación Antonio Núñez Jiménez de la Naturaleza y el Hombre, 1995–2000.
25. Ibid.

Chapter IV

WATER FOR IRRIGATION PURPOSES, THE LEGAL FRAMEWORK AND PARTICIPATION OF WOMEN IN URBAN AGRICULTURE IN HAVANA*

This chapter addresses three important topics and provides a broader picture of the urban agricultural evolution in Havana, covering issues related to the specific conditions and problems in Cuba.

The analysis of these subjects goes beyond the food production sector to include additional information that would allow a better understanding of discussions in the chapters covering the two regions under study.

* *Mario González Novo, Ramón Pérez Leira and Jorge Kalaf-Maluf Potts helped with the drafting of this chapter.*

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Water for Irrigation Purposes

Studies show that one of the main obstacles facing urban agriculture in Havana is the availability of water for irrigation. A summarized analysis concerning the status of this vital resource in Cuba and in Havana is presented below.

In Cuba, 80 per cent of the average annual precipitation (1,375 mm) falls during the rainy season (May to October). The potential water resources in Cuba are estimated to be approximately 38,139,000m³. Of this potential volume, only 63 per cent is usable, that is, 23,988,000m³, of which around 75 per cent are surface waters and the remaining 25 per cent underground waters.¹

The total water consumption in Cuba in 2000 was 6,888hm³, distributed by sector as follows:

Sectors	Distribution (%)
Water supply for the population and industry	30
Irrigation of rice	30
Other uses	18
Irrigation of sugar cane	10
Irrigation of starchy root crops and fresh vegetables	9
Irrigation of citrus and other fruit trees	2
Irrigation of pastures and fodder	1
TOTAL	100

As shown above, irrigation of rice crops and supply for the population and industry represent the highest levels of water consumption (each being 30 per cent of the total). Cuba has been striving to recondition and maintain the networks for the public water supply system, which is in an advanced state of deterioration.

In Havana, as the most critical example, in order to channel the required amount of water for each person, it is necessary to provide more than 600 litres/person/day. It is believed that more than 55 per cent of such volume is lost because of leaks in the water supply system and the distribution networks.²

Another factor to be considered is that approximately 20 per cent of the total population of Cuba lives in Havana, where an important part of its industry is also located. This explains why irrigation for the agricultural

sector does not figure among Havana's main water uses. It accounts only for 2.8 per cent of the province's water potential, not including the water volumes imported from sources located in La Habana province.³

Generally speaking, water consumption in Cuban cities is affected by numerous factors that tend to increase the use of water. One example is the growing tourist and restaurant sectors, which exacerbate the poor performance of reservoirs, conveyance and distribution works.

On the other hand, work is currently under way to increase efficiency in the water usage,⁴ through the following initiatives:

- The Instituto Nacional de Recursos Hidráulicos (INRH) is developing actions towards the establishment of a pricing policy, rules and regulations, and for seeking joint-venture partnerships with foreign companies.
- The media are using several strategies for promoting a culture of conservation among the Cuban population and other users aimed at saving water resources.

It was in this critical situation that the massive development of urban agriculture began in Havana. It is important to note, however, that even though we lack the related statistical data, the use of the city water for irrigation purposes was not an additional overhead expense for that period, and even possibly for the first five years, since the activities of most production facilities and other large water consumers had practically ceased. This situation changed as the Cuban economy began to show signs of gradual recovery.

The water currently used for irrigating urban gardens and intensive-cultivation gardens in Havana comes from the following sources:⁵

Source	Total number of units (%)
Water supply network system for the population	38
Wells	29
Reservoirs, dams and mini-reservoirs	28
More than one source	4
Pipes (containers)	1

Note: Reuse is negligible and therefore not included.

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Another factor that should be considered, although no supporting data is available, is that most urban farmers use the public water supply network system for their irrigation needs. No reliable source of information exists concerning the actual water consumption for this purpose in the agricultural activities in Havana.

The sustainability of urban agriculture is largely dependent on the appropriate use of water resources. Among the possible channels to be explored for reaching the objective of sustainability, we should consider the following:

- Development of techniques and technologies for decreasing the irrigation needs.
- Use of low-water-consumption irrigation systems.
- Selection of crops better adapted to the soils and climatic conditions of the specific region in which they are to be established.
- Promotion of water reuse for irrigation purposes.
- Use of financial mechanisms that would help to create a conscious habit of saving water.
- Application of environmental education strategies and activities that stress the special value of the water resource in Havana.
- Development of technically sound regulations by all the agencies involved in water resource management, so that they can develop standards for authorizing the use of water in each place, depending on the technologies used, the destinations of their products, and the actual services that they provide.

Legal Framework

Throughout this book we have been stressing the recognition and support provided by the Cuban government to urban agriculture throughout the country and, particularly, in Havana. We have also mentioned a few issues concerning the legal framework governing its activities. The summarized report below shows the most relevant aspects of the legal framework covering urban agriculture.

It is important to note that the legal framework governing this sector was not specifically developed for urban agriculture. There has been an evolution whereby existing rules and regulations governing the agriculture/livestock sector have been adapted and adjusted, and Resolutions have been added in order to strengthen this sector in Cuba. We have also included

in this chapter the specific agreements and regulations adopted for this important urban activity.

*Laws, Resolutions and By-laws applied to Urban Agriculture
(without mentioning it specifically)*

- **Resolution 24/91** (Article 13): Allows for the handing over of land, to be beneficially owned, to people who were already using it (without title deeds) before July 1986, for agricultural purposes, on a regular basis.
- **By-law 142/93**: Concerning the Basic Units for Cooperative Production (Unidades Básicas de Producción Cooperativa). Allows for the handing over of state-owned land for an indefinite period of time, to be beneficially owned, to a group of people who are legally incorporated. These groups also have other prerogatives, such as, among others, the possibility of creating funds for new investments from profit derived from the sale of their products.
- **Resolution 223/95**: Allows for the handing over of land, to be beneficially owned, to small-size farmers with well-established farms, so that they can expand their farming area.
- **Decree 191/94**: Established Agriculture/livestock Markets as a trading form based on supply and demand.
- **Resolution 768/98**: Provides for the handing over of land, to be beneficially owned, to Enhanced Credit and Service Unions (Cooperativas de Crédito y Servicios Fortalecidas). These cooperatives have existed since the 1960s.
- **Resolution 960/98**: Defines the basic principles for creating a new type of state-owned farm. These farms emerged as an option among other forms of agricultural production in Havana.
- **By-law No. 153**: Sets out regulations for plant health.
- **Law 85/September 1999** (Forest Act): Sets out the legal provisions in line with the forest policy in Cuba. It includes ways for providing incentives for reforestation and the multiple and sustainable use of the country's forest resources.

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Laws, Resolutions and By-laws that have Incorporated Urban Agriculture Components

- **Joint Resolution of 1998** between the President of the Havana government and the Minister of Agriculture: It authorizes and sets out rules and regulations for pig-raising activities in Havana, a practice that was excluded in **Resolution No. 604 of 1990**.
- **Joint Resolution 01/2000** (between the Ministries of Agriculture and Domestic Trade): Defines the different forms of market access for the entire nation. It includes producers in backyards and small plots, the Basic Units for Cooperative Production, and the Credit and Services Unions. It repeals **Resolution 02/98** and **Agreement Number 74** of the People's Power Provincial Assembly in Havana.

Laws, Resolutions and By-laws Issued for Urban Agriculture

- **Resolution 140/92**: Allows the handing over of land to be beneficially owned, free of charge, to agencies, companies, research centres, schools and other government bodies for the purpose of cultivating products for their own needs.
- **Resolution 356/93**: Allows the handing over of vacant lots up to 2,500m² in size, to be beneficially owned, free of charge, to retired people for the purpose of cultivating products for their own needs.
- **Circular Letter 03/98** from the Executive Committee Secretary of the Council of Ministries to the Administration Heads of Central Government Agencies and Presidents of the Provincial Administration Councils: Sets out measures for the rapid and sustainable development of the production of fresh vegetables in urban areas.
- **Resolution 4/99**: Sets out rules and regulations for products and phyto-sanitary mixtures that can be used in all forms of urban agriculture. Includes authorization for the use of specific types of chemical products.
- **Land Management Structure in Havana/July 1999**: Defines the areas in the city that can be used temporarily or permanently for urban agriculture, as well as the intention of reshaping its different modes to accommodate them in a coherent manner to the functional structure of the land base.

The Role of Women in Urban Agriculture

Cuban women, who account for 49.9 per cent of the total Cuban population, have had access to all the levels of education provided by Cuba, free of charge, throughout the revolutionary process initiated in 1959, enabling them to develop their scientific and technical capabilities. In 1997, women accounted for 42.5 per cent of the active labour force in the public sector, and 64 per cent of the technicians were women.⁶ These figures have not changed significantly since then.

Starting in 1959, in addition to eliminating all restrictive measures blocking women's access to jobs traditionally reserved for men, Cuba adopted new measures to increase women's participation in the work force, to protect their rights and to secure equal opportunity as well as equal payment.

According to statistics, women's participation in the health, education and tourist sectors accounts for approximately 50 per cent of the total labour force. This trend is not the same in the agricultural sector, where women account for only about 20 per cent of the total work force, 30 per cent of the technical work force and only 11.6 per cent of the leaders in the sector.⁷

These statistics show to what extent Cuban women are important in the Cuban economy but, even with all the progress made in this respect, women continue to bear the main responsibility for the household duties and child care.

The burden of domestic tasks and the care of their families became more difficult for women to bear during the years of the economic crisis. Their opportunities to assume leadership positions were restricted by, among other problems, the extra time and energy spent looking for food, preparing meals, doing the household chores, and the persistent cultural tradition of giving preference to men.

Women trapped in this situation cannot participate in urban agriculture as producers, especially in those modes that are not a source of employment. Therefore, this work is left for the men in the family, since they have the time to tend the garden.

It is interesting to note, however, that in the agricultural modes that are a source of employment, women also represent a minority of producers. An explanation for this tendency can be sought in the Cuban tradition of a masculine paid workforce in sugar cane plantations that did not favour the participation of women. As a result, Cuban women did not develop a tradition of working in the fields.

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Women in Havana account for 52.5 per cent of the total population, 46 per cent of the civil sector labour force and 66.8 per cent of the technical work force. These figures show a marked presence of women in the technical and administrative categories within the agriculture sector, reaching 53.5 per cent.⁸

Percentage of women in leadership positions

Activity	(%)	Comments
Ministers	6.0	
Deputy Ministers	9.0	
Education	48.6	Women assume leadership positions in the elementary school system, but not at higher levels.
Health	35.8	This figure includes mainly ward head nurses.
Scientific-technical sector	26.1	
Sugar processing industry	10.5	
Basic industry	12.9	
Agricultural sector	11.6	

Source: Centro de Investigaciones de la Economía Mundial (CIEM). *Investigación sobre desarrollo humano y equidad en Cuba 1999*. Havana, Caguayo, 2000.

There are no statistics or other reliable sources of information concerning women directly linked to agricultural production activities in each of the urban agriculture modes developed in the capital city. That is why gender issues are addressed specifically and in greater depth in the chapters concerning the two regions under study.

However, the experts consulted agree that the estimated figures could vary between 10 per cent and 15 per cent of the total number of producers in Havana. It is important to note that in the rural sector women account for 11.6 per cent of the members of the National Association of Small-Size Farmers (ANAP) and 11.2 per cent are land users and landowners.⁹

It is also believed that approximately 70 per cent of the technical force in the grassroots government bodies of the Ministry of Agriculture in Havana are women, but at the relatively higher management levels the presence of women correlatively decreases. Women hold 11 per cent of the positions of responsibility at the municipal level, and 7 per cent at the provincial level, a rate that can be extrapolated to national levels.

Notes

1. Ramón Pérez Leira, 'El agua en la emergencia de una nueva época', *Ilé. Anuario de Ecología, Cultura y Sociedad* [Havana], 1:1 (2001): 31–47.
2. Ramón Pérez Leira, 'Agua para todos y todos para el agua', *Se puede vivir en Ecópolis* [Havana], 22 (2000): 25–29.
3. Jorge Kalaf-Maluf, 'La cuenca del Almendares. Viabilidad de las diversas alternativas en pos de su rescate', Havana, Delegación Provincial de Recursos Hidráulicos, January 2001.
4. Ibid.
5. Mario González Novo, 'Institucionalización de la agricultura urbana en Ciudad de La Habana'. Paper presented at the Regional Conference 'Agricultura Urbana en las Ciudades del Siglo XXI'. Quito, Ecuador, April 2000.
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7. Carolina Aguilar, Perla Popowski and Mercedes Verdeses, 'Mujer, período especial y vida cotidiana', *Temas* [Havana], no. 5 (January–March, 1996): 11–17.
8. Mario González Novo, 'Agricultura Urbana en Ciudad de La Habana. Estudio de caso', Havana, August 1999.
9. Asociación Nacional de Agricultores Pequeños. Dirección Nacional de Relaciones internacionales y ANAP Provincial de Ciudad de La Habana. February 2001.

Chapter V

TRADING OF URBAN AGRICULTURAL PRODUCTS IN HAVANA

The trading of urban agricultural products in Havana was introduced as the result of surplus production and the cultivation of products specifically intended for sale.

This chapter addresses the transition of urban agriculture from subsistence cultivation to cultivation for consumption by producers and for trading purposes. It also includes the characteristics of urban agricultural production intended for sale and the legal framework that regulates this transition.

As previously stated, the practice of urban agriculture in Cuba, and specifically in Havana, arose from a situation of acute economic crisis and as a way of contributing to the people's food security that involved them directly in the process. That is why the products of the first modes of production – state farms for producers' consumption and community gardens – were not initially intended for trade but for the producers' families and/or for the workers from the work centres.

The training and technical assistance provided to urban producers, together with the recovery of traditional agricultural experience led to a progressive increase in the yields of crops such as tubers, roots, grains and vegetables. As a result, a modest level of surplus was generated. At first it was directed to providing food support to social institutions (schools, day-care centres, homes for mothers, nursing homes, homes for the handicapped and others). This was a spontaneous way of making repayment for the free use of state-owned land.

As the surplus continued to increase, the first forms of trading started to appear. It is not possible to estimate the exact time when the sales began, but it is clear that it happened during the second year of the full urban agricultural development (1991–92).

These activities of sporadic, informal and small-scale trading were performed by

- State farms for producers' consumption, mainly managed by their own workers, selling what remained after having satisfied the demands of their own cafeterias.
- Small urban producers (plots, backyards, roof production, etc.) selling their surplus to their closest neighbours.

Trading as such, however, only appeared in 1993–1994 with the development of urban agriculture and the establishment of community urban gardens and high-yield urban gardens (OAR), since the output of their production, especially that of the OARs (fresh vegetables and cooking herbs), was intended primarily for sale to the general public.

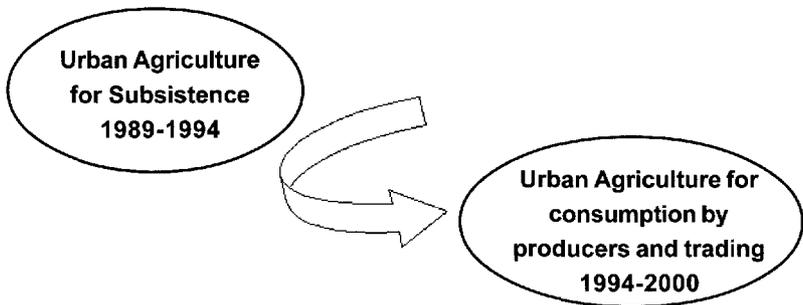
Small-scale farmers in the outskirts of Havana, who later on were also integrated into urban agriculture, should be dealt with in a separate study. These farmers, whose agricultural yields at that time were low because of the lack of fertilizers and agrochemical products – on which they had become dependent – could only market their products directly to a specific state-owned company, the Food Products Directorate (Dirección Nacional de Acopio). By the end of 1995, however, these farmers started to increase their yields progressively using traditional modes of production.

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Simultaneously with all these processes, the National Assembly of the People's Power (the highest government level), in September 1994, approved the creation of agricultural markets for selling products at free-market prices governed by supply and demand. Independent farmers, UBPCs rural (a partnership mode approved in 1993), other cooperative modes of production and state-owned companies would bring their products to be sold in these agricultural markets.

This study shows that by the fourth and fifth year of the urban producers' movement, including small-scale farmers in the city outskirts, there were a number of farmers who were much better prepared for obtaining higher yields per area, as well as a production surplus. At that time, the two modes of urban garden production were also established and there was a level of legal recognition concerning the sale of agricultural products in a free-market environment.

It is safe to assume, therefore, that the transition of urban agriculture from cultivation for subsistence to cultivation for consumption by producers and for trading occurred at the end of 1994 and early in 1995.



Trading of Urban Agriculture Products between 1994 and 1998

This jump to the commercialization of agricultural products was made possible mainly by the conditions being developed over four or five years. It was accompanied, with the exception of the OARs, by a process of motivation and incentives directed to producers, since it was also necessary for them to change their ideas about direct trading being an illegal activity.

All the different modes of urban agriculture were selling their products, without paying any taxes, in the following manner:

Production modes

State farms for producers' consumption

High-yield urban gardens

Community and intensive-cultivation gardens

Agricultural Support Stores

Seedling greenhouses

Basic Units for Cooperative Production of Organic Matter

Farmers' Associations

Sales Outlets

In their own work centres

In their own production units

In their own production areas

In their facilities and production areas (services)

In their facilities and in the agricultural support stores

In their facilities and in the agricultural support stores

In their own production areas (selling to state-owned companies) and in any of the other authorized forms of trading

Trading of Urban Agricultural Products from 1998 to the Present

Urban agricultural trading was, then, an activity with its own particular characteristics, without the obligation of paying taxes and that was restricted mainly to production areas. In 1998 there began a new phase in which the sector started to organize itself within its own legal framework, including the setting of taxes, regulations, prices, sales outlet locations and approvals.

It is evident that this legal framework, in a country where for more than 30 years all commercial activities were centralized and performed by the state, had to undergo a process of transition, which included the following stages:

1. In December 1998 the Ministries of Agriculture and Internal Trade passed Joint Resolution 02/98 whereby the various agricultural product trading modes were defined (markets approved in September 1994 by By-law 191/94). This Resolution also included backyard producers, small plots producers, basic units for cooperative production (UBPC) and Credit and Service Cooperatives (CCS).
2. In June 1999 the Havana Provincial Administration Council approved Agreement No. 74, whose objective was to 'organize all forms of trade in agricultural products in Havana, enforcing the standards and procedures set down for each form of sale in order to facilitate, as

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much as possible, the acquisition of agricultural products by the population, and to define the maximum prices allowed for the sales'.

This Agreement set down, among other regulations, the following:

- Community gardens, Intensive-cultivation gardens and Credit and Services (CCS) shall sell their products in the sales outlets (mobile and fixed) authorized by the Municipal Administration Council of their jurisdiction. People wishing to open a sales outlet should comply with the requirements set down by the Physical Design, Public Health and Trade Directorates in order to obtain proper authorization to register their businesses in the Trade Registry.
 - The urban agriculture production modes mentioned above could charge, for their products, 20 per cent less than the prices in the nearest agricultural market, pay 5 per cent in sales taxes for products sold and 2 per cent for other services.
 - Sales outlets for farmers and private producers in the municipalities outside the city limits shall be granted exceptional approval by the Administration Council of the municipalities at the edge of the city in cases of proven impossibility to access another authorized network. The same regulations on prices and taxes apply.
3. In August 2000, Joint Resolution 02/98 and Agreement 74 were repealed, and Joint Resolution 01/2000, issued by the Ministries of Agriculture and Interior Trade, came into effect. In brief, this Agreement states the following:

Sales Outlets

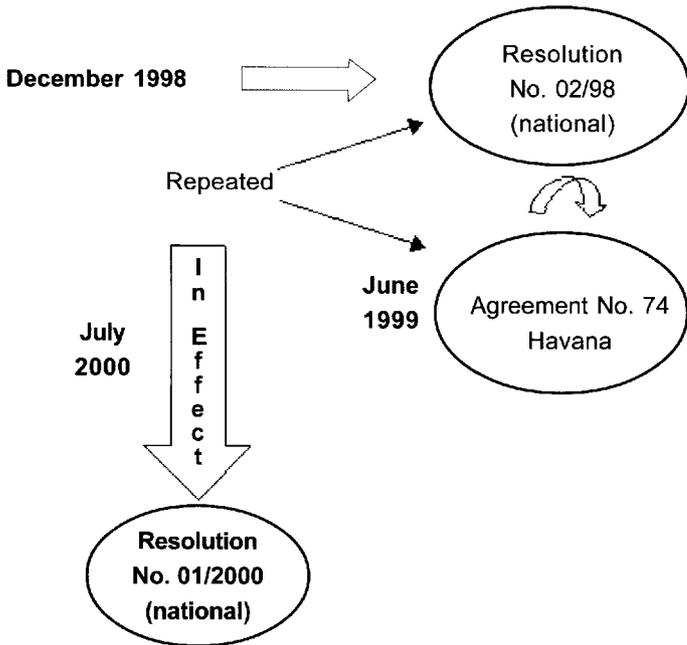
- Community gardens, Intensive-cultivation gardens, CCS and other modes of agricultural production shall sell their products in the sales outlets (mobile and fixed) authorized by the Municipal Administration Council in accordance with the characteristics of each place.
- Community gardens and Intensive-cultivation gardens may sell other agricultural and livestock products that they buy from nearby backyards and plots, ensuring compliance with the technical, productive and organizational regulations governing the opening of the sales outlet.
- Sales outlets shall be authorized and registered in the Central Trade Registry, as provided by the Ministry of Internal Trade. They shall

sell their products at prices lower than those in the agricultural-livestock market.

Agricultural-livestock Markets

- UBPC, CCS, producers with surplus in the areas granted for production consumption by the family and producers cultivating crops and raising small livestock in backyards and plots may bring their products to the agricultural-livestock market.

Graphic summary



As can be seen here, Resolution No. 01/2000 repeals both Resolution 02/98 and Agreement No. 74. It covers more general aspects and does not offer details on the taxes and price parameters that were included in Agreement No. 74 for Havana.

It is important to note that none of these documents issued include the possibility of farmers' trading in their own production areas, although they do not prohibit it either.

Trading Forms

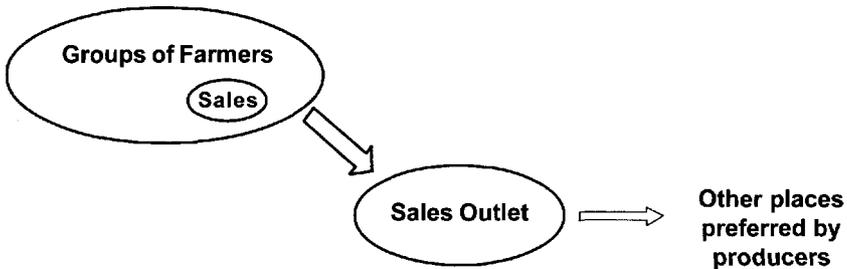
The various modes of urban agriculture in Havana sell their products in the following ways:

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Farmers. Producers are authorized to sell in sales outlets (small light-structure facilities) located in the same production area or in other places preferred by the producers.

In order to open a sales outlet, producers have to apply collectively (group of farmers), obtain a commercial licence and pay 5 per cent sales taxes. Of this 5 per cent, 4 per cent goes to the National Taxation Office (ONAT) and the remaining 1 per cent goes to the Municipal Urban Farm to cover the salaries of its technicians and other operational expenses.

Farmers are not allowed to sell products not originating in their own production areas or prepared using their own output.



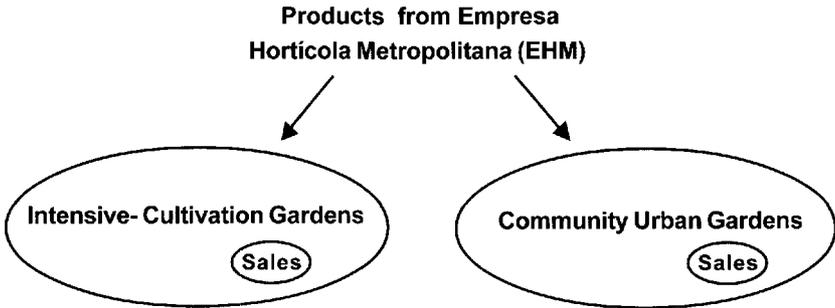
Farmers may sell individually in agricultural-livestock markets. In this case, the market management charges farmers 10 per cent of their daily sales income, of which 5 per cent is for the actual sales and 5 per cent for the services that the farmers use in the market (toilet, music, among others). Each farmer also has to pay for the space and table/counter used to sell the products. The prices charged by the farmers are the same as those in the agricultural-livestock market.

Although the practice is not legally regulated, some farmers occasionally sell on their own production areas at prices governed by free supply and demand, but always below the agricultural-livestock market prices. A representative of the Urban Municipal Farm arranges the authorization with the People's Council for this type of producer.

Intensive-cultivation gardens and community urban gardens. Products from these production modes are sold in sales outlets located in the same area. Producers must have a commercial licence and pay a 5 per cent tax on their sales. Of this 5 per cent, 4 per cent goes to ONAT and the remaining 1 per cent to the Urban Municipal Farm.

Producers in these modes of production also sell fresh and prepared agriculture-livestock products that they buy from the Empresa Horticola Metropolitana (Metropolitan Vegetable Company) though the Urban

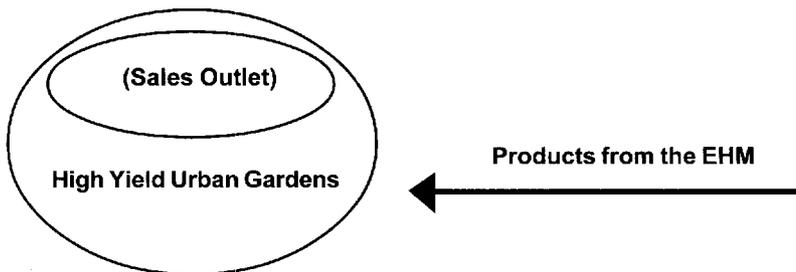
Municipal Farm. Prices are set by producers, always below the agricultural-livestock market prices as stipulated.



High-yield urban gardens. They sell their products in their own units at the prices set by the Commercial Department of Empresa Hortícola Metropolitana (EHM) of their jurisdiction. Prices are set below those charged in the agricultural-livestock market, as provided for in Resolution No. 01/2000.

OARs always sell products harvested or prepared in their production areas, as well as tubers, roots, grains, fruits, dehydrated cooking herbs and home-made canned food obtained by means of arrangements that the EHM makes with independent farmers, UBPCs, CCS and state-owned companies.

All profits earned by OARs are collected by the EHM, whose role is to pay salaries and bonuses (payments beyond the basic salary) to workers and remit taxes to ONAT.



Agricultural support stores. As their name indicates, these stores deal exclusively in the trading of agricultural-livestock products and services. They report to the Empresa de Suministros Agropecuarios (ESA) of the Ministry of Agriculture.

ESA is a company that primarily provides seeds (bought from the EHM) and phytosanitary chemical products (applied by the agricultural

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extensionist); the agricultural support stores deal with the other products. For seeds and other products designated as 'protected', the stores set the sale prices with a maximum percentage (above the price paid for the product) determined by the EHM.

Margins of profit beyond cost price

Products	(%)
Seeds in bulk	10
Seeds in envelopes	20
Organic matter	25
Technical literature	25
Fruit-tree seedlings	25

The products considered essential for production are termed 'protected' and are the stores' raison d'être.

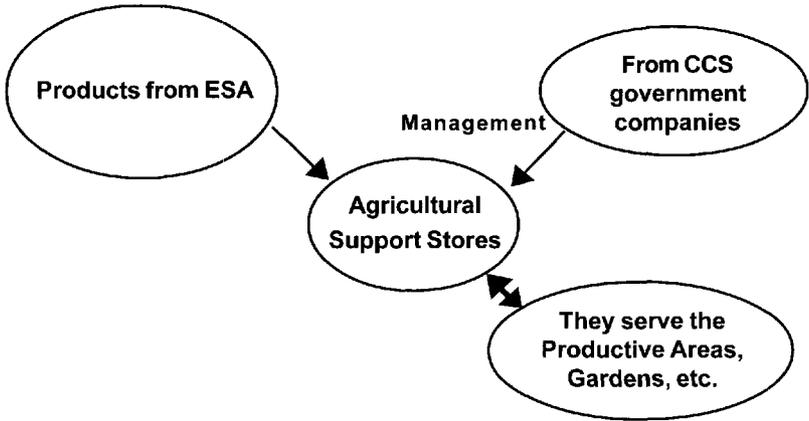
As for the non-protected products, the stores assign them a sale price, but 40 per cent of the total sales made goes to the EHM.

Concerning services (spraying, sowing, pest management, fertilization, technical assistance, irrigation projects and others), the store sets the price through an agreement between the agricultural extensionist and the producer. The former receives 80 per cent of the total payment for the service provided and covers the cost of the products used and other related expenses incurred; the store's profit is the remaining 20 per cent, of which 40 per cent goes to the ESA.

Workers in stores are not paid a salary but received a commission on monthly sales and services. Average incomes are between 300.00 and 400.00 Cuban pesos a month, a figure that is well above the average salary in Cuba (1999: 221.00 Cuban pesos, as per the Cuban National Bank Report). However, this income varies according to the location of the store (high or low level of agricultural-livestock activities and the local purchasing power), and also depending on the season.

Stores remit to the ESA on a monthly basis 20 per cent of the advance payments that they make to each of their workers.

The ESA pays centrally to ONAT 5 per cent tax on the sales in all the city stores and it also informs the ONAT municipal branches about the payments made by the stores under their jurisdiction.

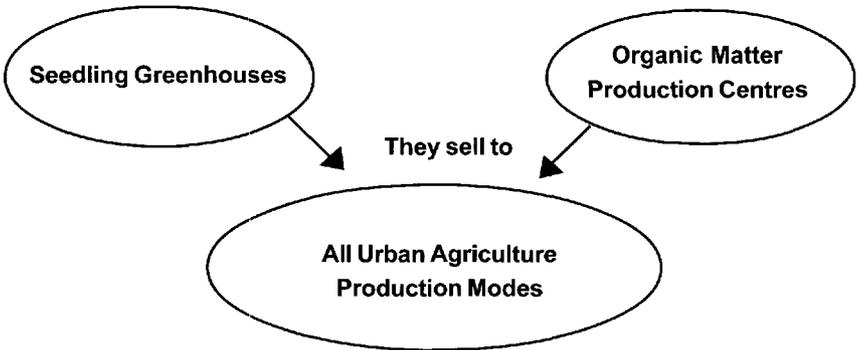


Seedling greenhouses and organic matter production centres.

Both facilities operate as UBPC and therefore are legally incorporated. For trading purposes the former are directly under the EHM, which is the body in charge of setting the maximum possible price for the sale of seedlings. The organic matter production centres, on the other hand, set their prices according to supply and demand. The explanation for this difference is that seedling greenhouses are part of a collaboration project with foreign funding.

Output trading from these two types of operations is done by agreements or directly with producers, according to the producers' needs. They sell their products to community gardens, farmers, and others, and also in the agricultural support stores to any interested party, after meeting the obligations of their agreements.

**Empresa Hortícola
Metropolitana Project**

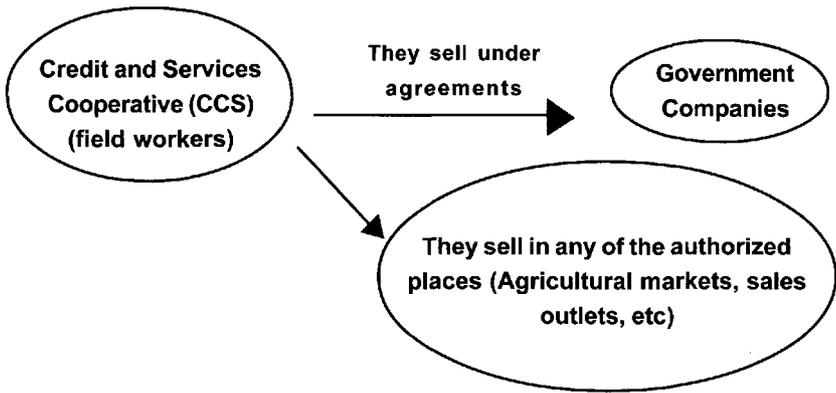


Credit and Service Cooperatives (CCS). As a farmers' partnership mode, the role of the CCS is to establish collective trading agreements

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with the two state-owned companies: EHM and Empresa de Jardines, the former belonging to the Ministry of Agriculture and the latter to the Government of Havana. Both companies have purchase prices officially set for the products included in agreements with the CCS, if they are interested.

Now each field worker who is a member of the CCS, after meeting the quotas collectively established by the CCS, may sell in any of the authorized market modes. In this case, the field worker sets the prices according to supply and demand.



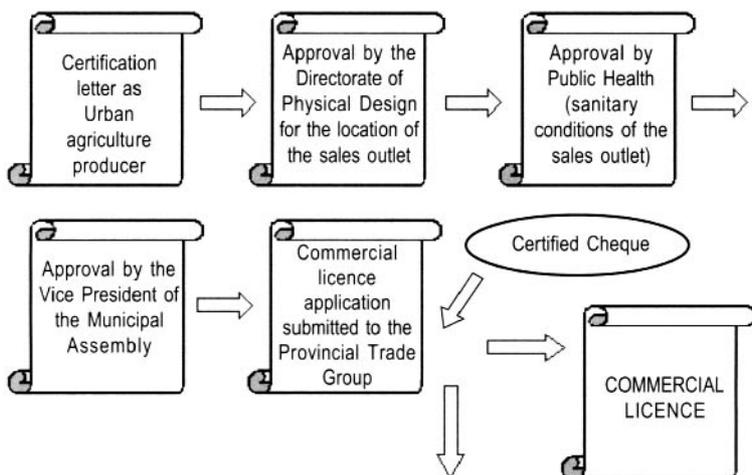
Regulations Governing the Sales Outlet and the Commercial Licence

The following steps are required in order to obtain permits and licences:

1. Producers are required to obtain a letter from the Municipal Urban Agriculture Group accrediting their status as urban agriculture producers.
2. This letter must be submitted, together with the application for opening a sales outlet, to the Physical Design Directorate (Dirección Municipal de Arquitectura). This Office issues a document approving the location (place where the outlet is to be open) and provides the building specifications (materials, design, among others).
3. The applicants then submit both approvals to the Ministry of Public Health's Municipal Directorate of Hygiene and Epidemiology (Dirección Municipal de Higiene y Epidemiología del Ministerio de Salud Pública). This Office assesses the products to be sold and sets down the hygiene and health-related conditions with which the sales outlet must comply and issues the corresponding documentation.

4. Once all the required documentation has been obtained, applicants request the actual authorization (document) from the corresponding Vice-President of the Popular Power's Municipal Assembly to build the sales outlets for marketing their products.
5. After steps 1 through 4 are satisfactorily completed, the producers may submit their applications for the commercial licence to the Provincial Trade Group of the Provincial Popular Power (Grupo Provincial de Comercio del Poder Popular Provincial).
6. At this last stage, producers must also present, with their submissions, a certified cheque for the amount of 85.00 Cuban pesos. This payment is an annual fee.
 - The UBPC and CCS only handle order cheques and must pay the bank a service charge of 9.00 Cuban pesos for each cheque in order to have their cheques certified.
 - The other producers make arrangements with the Metropolitan Fresh Vegetable Company through the Municipal Farm, for obtaining the certified cheque to be submitted to the Provincial Trade Group.
7. The producers with their Commercial Licence, which is granted for a five-year period, are duly authorized for marketing agricultural products at the sales outlets.

Summary of the documentation necessary for opening a sales outlet and obtaining a commercial licence



Of the 509 sales outlets currently operating in Havana 90% have their licences and the remaining 10% are being processed

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Main Problems in Enforcement of the Law for Obtaining a Commercial Licence

Producers:

- Producers consider that the formalities for obtaining a commercial licence are too many and too complex to follow, considering the distances and the number of institutions involved.
- Only the UBPCs and CCSs – being legally incorporated entities – may handle the procedures for obtaining a commercial licence directly, while all other producers have to resort to the EHM as an intermediary, introducing further complications into the process.
- It is necessary to convert order cheques into certified cheques.
- Delays in obtaining the commercial licence may affect the sales of their products, given the reduced quality of the product, since inspectors will not allow sales without proper documentation.
- They think that the 5 per cent tax on sales is high.
- In general terms, they consider that there are too many controls and that the reports they must submit take time away from their production operations.

Urban Municipal Farm

- In order to obtain a commercial licence for producers not incorporated as legal entities, the Urban Municipal Farm has to collect the money from the producers, request a certified cheque from the EHM and then go on to the other formalities with the Provincial Trade Group. In practice, producers have to carry out all the procedures and then hand the documentation they obtain over to the Urban Municipal Farm.
- The Urban Municipal Farm in its turn has to provide a great many documents to the different agencies requesting them, taking up time that should be spent on technical assistance and organizational matters or other roles.

General Considerations

The trading of urban agricultural products in Havana has followed its own development pattern, with a diversity and dynamics that are different from those of any other form of trading in Cuba, and it is showing a tendency towards consolidation.

This activity is undergoing a process which, given the characteristics of its most recent phase and its legal framework, requires more time for its application and enhancement so that a more objective evaluation of its results and impacts can be carried out. However, the following considerations are already evident:

- The contribution of trading to food security is having an impact on prices (lower prices) and on the types of products (such as leafy green vegetables) on sale in agricultural-livestock markets, without negatively affecting the producers' income. It is important to note that, although prices in the agricultural-livestock markets have been gradually decreasing since their creation, they are still high compared to the average salary in Cuba.
- Although problems still exist, such as the many formalities for obtaining a commercial licence and other requirements related to trade in agricultural products, it is evident on the one hand that the resolutions and agreements set down have become more flexible in order to facilitate trade, and the urban agriculture governing structures are working towards the same end.

An example of this is that the EHM assumes the responsibility for paying taxes centrally, not as a control measure but as a way of relieving producers of the need to do it themselves, since regulations require them to effect the payments on a daily basis to ONAT.

- On the other hand, the Urban Agriculture National Group has issued guidelines for a new subprogram in 2001 for developing urban agriculture with respect to trading. Some of the objectives of this subprogram are the following:
 - (i) To trade agricultural products in an efficient and expeditious manner.
 - (ii) To have the networks of sales outlets and small city squares located in such a way that they would meet the needs of the city and the towns.
 - (iii) To apply Resolution 01/2001 of the MINAGRI-MINCIN in the best way possible.
- Although no quantitative information on the subject is available, it is possible to say that this direct selling of urban agricultural products, without resorting to an intermediary, is generating a level of income, by producer, similar to that of the highest salaries in Cuba, which is

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consistent with the dedication and efforts that agricultural labour requires and with its social importance.

The production, trade, actors, income and benefits of urban agriculture at the local level, whether this is the municipality or a People's Council zone, are already showing an impact in the creation of an economy on that scale. However, the local economy does not depend on only one activity – an activity that is still in its growing phase and is not yet consolidated.

Chapter VI

PARQUE METROPOLITANO DE LA HABANA PROJECT*

This chapter discusses the origins, features and needs of the Parque Metropolitano de la Habana (PMH) Project, as well as the relevance of incorporating urban agriculture as an environmentally and economically necessary component of its implementation.

The different forms of urban agriculture carried out in the PMH and their potential for fostering citizen participation, environmental awareness, reforestation and the local economy, all necessary for implementing the project, are also considered and compared.

Harahí Gámez Rodríguez and Carlos Álvarez Carrés collaborated in the writing of this chapter.

Background

Historically, Havana has been a city lacking green space. This lack, dating back to the colonial period when greenery was confined to patios, certain plazas and tree-lined avenues, is even more noticeable in larger spaces.

Although the city was influenced in the nineteenth and twentieth centuries by international trends incorporating green space as an integral part of urban design – which inspired the appearance of large gardens, streets, avenues and one-hectare parks in some of its neighbourhoods “ it was not until the early 1960s that a newly created group of physical planners prepared the first Havana Master Plan. This plan contained a comprehensive proposal for developing green areas and a land structure that defined, among other things, sites for parks at the municipal level.

The Parque Metropolitano de La Habana (PMH) was one of the parks conceived by the 1963 Master Plan and has been retained in all subsequent development plans that have been designed, including the Green Space System in the city’s development plan to 2010. As early as 1926, the outstanding French urban planner, J.N.C. Forestier, had suggested creating the Gran Parque Nacional as a component of the beautification and expansion plans for Havana in part of the space occupied by the current project.

Given this background, it is understandable that even with the increase in new construction that the city experienced after the Revolution until the 1980s, the Provincial Physical Planning Branch, the governing institution, did not approve any expenditures requested for productive facilities, housing or other construction deemed a priority at that time within the area intended for the park.

It is interesting to note that the city’s administrations and governments during that period made this park project their own and defended it to some extent, even with the pressures of economic and social development. Only the construction of the National Circus headquarters and a sports complex was promoted and authorized, as it was thought that both facilities would benefit the park and promote other investments of that type.

The proposed site for the future PMH forms part of a large green belt located in the western area of the city that extends north-south from the mouth of the Almendares River, the most important in the province, to Calle 100. This large green belt was designed to comprise the city’s four large parks: the National Zoological Park, the National Botanical Garden, Lenin Park and the PMH, which is the most urbanized.

The first three suburban parks were built before the acute economic crisis of the 1990s. Their construction involved significant costs and

mitigation of the impact on housing, industrial and other facilities in the area.

It should be noted that, although we are currently working towards better forms of participation, these city parks had an undeniable participatory component. This is reflected in the fact that while planning was reserved for technicians, professionals and managers, citizens did participate en masse in their construction.

Although the implementation of the PMH project has been delayed because of its complexity and the amount of expenditure required, work on the project has continued.

- In 1989 the PMH working group was created by the Vice-President of the Council of Ministers to develop actions aimed at improving the environment.
- In 1994 the revitalization of the PMH project began with the reclamation of one of its areas, the Parque Almendares.
- In June 1995 the first convention on international cooperation was signed between the PMH and the Canadian Urban Institute for its institutional and professional capacity building. From this moment, efforts to prepare a comprehensive development strategy in which residents participate from the diagnostic and planning stages to implementation and assessment were set in motion.

The Parque Metropolitano de La Habana Project

The site occupied by the PMH project is approximately 700 hectares (ha). There is a significant diversity of operations within this area both in the use of soil and buildings and in green spaces and social components. This is demonstrated by the differences between the mansions inhabited by the middle and upper classes in the Miramar and Nuevo Vedado areas and the modest houses of the working-class neighbourhoods of Pogolotti and El Cerro. Between these neighbourhoods lie the precarious settlements of El Fanguito and La Isla del Polvo. Today all of these neighbourhoods show great cultural and racial diversity.

Further evidence of diversity is the presence of industries and workshops from different productive sectors. There are also farms that are not very productive and, although on the fringe of Cuban agriculture, have high agricultural inputs harmful to the environment and cannot be considered traditional agriculture. Equally notable are the old and deteriorated yet still beautiful gardens at the two breweries in the heart of the area, as well as the more than 500 hectares that have been deforested.

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The PMH project is incorporating a new way of thinking and acting into urban planning, starting with reclaiming and making good use of all that exists in the area, apart from current incompatibilities that can be rearranged or can coexist, and even become an economic, educational and ecological potential that must be preserved.

The PMH project team has proposed the following mission: 'To create an ecologically, economically and socially sustainable park for the enjoyment of Havana's residents.'

Among the main objectives are:

- Creating a green lung with multiple uses, using a minimum of 80 per cent of the land for reforestation, agricultural development and gardening.
- Using this project as an example of sustainable landscaping, where problems become opportunities.
- Carrying out an environmental cleanup of the site, focusing on the Almendares River as the central element of the PMH.
- Promoting economic development of the PMH to guarantee its economic self-sufficiency.

Given that the PMH is a complex and ambitious project, efforts have been prioritized in six work plans:

1. *Investment Planning and Development Programme.* This is aimed at establishing services as soon as possible with a minimum of resources and halting the deterioration of existing facilities in the park, as well as developing other facilities which generate income that is reinvested in PMH project activities.
2. *Agroforestry Programme.* The programme's main objective is to create a green lung with multiple uses and improve the environment, using a minimum of 80 per cent of the park's land for reforestation, agriculture and gardening.
3. *Environmental Education, Participation and Communication Programme.* This programme seeks to develop environmental awareness in the community and promote the PMH project to all of Havana's residents through the media.

The PMH project hopes to work with all members of the community – residents, industrial workers, local governments, People's Councils, producers, individuals and organizations who have a certain interest in the park and/or have economic resources to contribute to its development, as well as those individuals and organizations that know, share and feel involved in the project.

4. *Protection Programme.* This programme seeks to harmoniously combine the physical and environmental protection of the park with maximum citizen participation.
5. *Sociocultural Development Programme.* This programme's development is fundamental, since the PMH as a social project must provide recreation and entertainment to Havana's residents, whether through existing facilities or directly with the community in the area's neighbourhoods. The educational component goes hand-in-hand with this program, and the project works towards identifying those who enjoy recreation and those who provide it with caring for nature and the environment.
6. *Cleanup Programme.* This programme aims to promote, together with the institutions involved, the development and implementation of a comprehensive process for cleaning up the Almendares River and including it in the watershed regulation project. It also seeks to reduce industrial pollution through joint actions with polluting industries and governing ministries.

The PMH team has stated that cleaning up the river is a comprehensive solution, in that it includes both the technical aspect of wastewater treatment and water purification and social components such as community participation in reforestation and environmental education, which will give it strength and continuity.

The PMH has been envisioned on a pedestrian scale for individual and group enjoyment, favouring a setting where many people can stay for long periods of time throughout the day.

It is also planned that the forest will become a central element providing shade, air and protection for pedestrians. The park must appear natural, although it may not be. This does not entail recreating the natural site as it may have been hundreds of years ago, but rather improving and recreating it with current ideas, designing a space for future generations to continue contributing to work that, given its nature, should never end.

Description of Natural Conditions of the Parque Metropolitano de La Habana Site

The area under study is located in the Almendares River Watershed region.

In this area, the effects of human activity are a general feature. Such activity has altered the course of the Almendares River and reduced its water level, as well as causing great changes in soils, which has led to a reduction in its agricultural use in many areas. Another important feature

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is the pollution of the entire area caused by mixed-waste dumping areas. The hydrographic network shows similar characteristics, receiving sewage from neighbourhoods surrounding Marianao, such as pollutants emitted by dozens of manufacturing centres both inside and outside the Parque Metropolitano area.

Geology

The area under study forms part of a sedimentary basin. Paleogenic terrigenous sediments upwardly transect carbonated sediments with new terrigenous deposits. A marly sequence predominates and is covered by limestone. An extensive development of Quaternary alluvial sedimentary deposits is observed, owing to the presence of the Almendares River Watershed.

Geomorphology

In the area under study, two basic types of reliefs were identified. These were divided into plains and low hills, in accordance with their morphology and morphometry.

The plains are the basic type and cover more than 90 per cent of the total area. They were divided into subtypes according to their origin: fluvial plains, accumulative plains, denudative plains and erosive plains with high slopes.

The hills form small sectors, the highest in the area, which were classified as low erosive-petromorphic altitudes.

Climatology

The area studied presents a climate resembling the typical Cuban climate, that of a tropical plain with long dry and rainy seasons. The information below was gathered over a period of ten years.

The highest temperatures are reached in the months of July and August, with an average monthly temperature of 27.3°C and 27.5°C, respectively.

The lowest temperatures occur mostly in the months of December and January, fluctuating between 20.3°C and 18.6°C, respectively.

The region's average annual temperature is 25.7°C.

Precipitation varies from one year to the next, showing some changes in the rainy and dry seasons (from May to October and November to April, respectively).

Most precipitation occurs during June and October, with 50.8 mm and 57.3 mm averages, respectively.

Wind blows predominantly from the east with a speed of 10.22 m/s. March and April are the windiest months, with average speeds of 14.02 m/s and 11.60 m/s, respectively.

Average annual relative humidity is 80 per cent, with June being the most humid month (88 per cent).

Soils

During the research process, the Soil Research Institute (IIS) of the Ministry of Agriculture prepared a map classifying agriculturally productive soils on the PMH site. This work permitted updating previous opinions, stating: ‘There is very good farm land in the PMH, composed mainly of soils enriched by alluvium from the Almendares River and its tributaries, the Mordazo and Santoyo Rivers.’

The new study showed that over time the soils became considerably impoverished, owing in most part to poor resource management, natural erosion, insufficient protection of the hydrographic belt and deforestation.

Currently, soils in category 3 (moderately productive) and 4 (not very productive) dominate in most dry-farmed crops. It is worth mentioning that the limiting factors with the highest incidence are deficient drainage and alkalinity, affecting 37 per cent and 57 per cent of soils, respectively. In general, more than 30 per cent of the area with agricultural potential is suitable for most irrigated crops.

History of Urban Agriculture in the Parque Metropolitano de La Habana

Since the eighteenth century there have been farms in the PMH area producing “minor fruits” that provided the city with many of the agricultural products its markets required. Subsequently, and for more than three-quarters of a century, Chinese communities settled in the area and produced mainly vegetables in intensive-cultivation gardens for the same markets. Alongside these Chinese immigrants lived dispersed field workers whose production was more extensive and diversified and, little by little, these became the sole occupants of the land.

In the 1980s, some of these field workers formed an Agricultural Production Cooperative (CPA), which was in operation until the mid-1990s.

From its beginnings, the cooperative posed serious organizational and operational problems, basically due to management changes and the instability of its members for various reasons, including a progressive lack of interest in the work. From an economic standpoint, the cooperative had serious difficulties caused by low production and failure to carry out plans. The shortage of – not to say nonexistent – supplies and the fact that a significant percentage of the workforce was hired help also had an impact.¹

Another operational problem was the difficulty in transporting goods, as the cooperative only possessed two tractors and a truck in deplorable

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condition. The cooperative's location in an urban area itself created instability in the workforce, as some of the members (non-farmers) did not have any knowledge of agriculture or incentives to produce and the economic situation prohibited the cooperative from encouraging its workers.²

As a result of the CPA's problems, the Ministry of Agriculture decided to disband it and place the land under the PMH's administration. It was then that their team devoted itself to preparing a development strategy for urban agriculture.³

The remaining field workers who were not members of the CPA (approximately ten) came together in 1994 with other field workers from land adjacent to the PMH in a Farmers' Grassroots Organization of the National Association of Small Farmers (ANAP) named Nguyen Van Troi. At the end of 1996, simultaneously with the Parque Metropolitano Team's working process, this organization was divided into three Credit and Services Cooperatives, one of which is located in the project area and retains the name Nguyen Van Troi.

Taking into account that there was no experience for integrating this agricultural activity into the city park project, the PMH Directorate consulted specialists in the field and the area's agricultural producers to develop a proposal on the matter.

As a result of this process, it was determined that PMH agricultural activity should be: *urban, agroecological, intensive and sustainable*. It was also decided that it was necessary, among other things, to conduct research on possible water supply sources, agriculture's contribution to the economic development of the park and local economy, soil types, their agroproductive capacity and the legal framework regarding the matter.

Other results of this process were already more connected to designing agricultural areas, their dimensions and ways of integrating them as poles of development and park attractions.⁴

In addition, it was considered important to establish the organizational technical bases for sustainable and self-sufficient development of agricultural production in the Parque Metropolitano. Sustainable development is understood to be improvement of the producers' quality of life, economic efficiency of agriculture and preservation of natural resources. Self-sufficient development involves agriculture's contribution to the economy and the implementation of the PMH project.

The Agroforestry Programme's medium-range goals were also defined, the following being considered the most important:

1. Improving the organizational structure of the agricultural area by creating small farms no larger than 4 or 5 ha.

2. Improving soil management while taking into account ecological criteria.
3. Developing water sources suitable for agriculture.
4. Guaranteeing the technical capacity of producers.
5. Ensuring the physical protection of the agricultural area.
6. Establishing the mechanisms for marketing the agricultural products produced in the PMH.

At the same time, the reforestation situation was analyzed. There was no reforestation plan for the PMH until 1992, because it depended on the plans of the four municipalities composing it. This led to a lack of attention to and prioritization of the park's needs. In July 1992, it was decided that the park would have its own plan, although coordinated with the municipalities. Completion of the park's reforestation plan was negatively affected by several factors. These included the shortcomings in promoting municipal nurseries, lack of contact with the urban community to promote and plan reforestation of its areas, shortage of farming tools and the lack of protection and maintenance of new plantations.

Description of Urban Agriculture in the Parque Metropolitano de La Habana

Forestry activity is included in the promotion and development stage of urban agriculture in the Parque Metropolitano. When tree plantations and the project are consolidated, this activity will assume its traditional role in the park.

Land devoted to agriculture in the PMH area covers 151ha. Some 88.4ha are being used for various crops, trees and vegetables, or 58.5 per cent of all agricultural land.

Of those 151ha, the Agroforestry Program aims to use 100 per cent, but only 60 ha have been set aside for agricultural production and they will support themselves with urban agriculture. This implies a change in use in the future (mainly tree crops) in part of the current areas being farmed.

Urban agriculture currently represents 12.6 per cent of the PMH project's total land. In the future, this activity will account for 9 per cent, a figure that will change depending on the stages of development and consolidation of forestry activity. It is worth repeating that the PMH will dedicate 80 per cent of its land to creating a green lung in the city, or 560 ha of forests, gardens and urban agriculture. The latter will represent 10.7 per cent of the green space.

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Parque Metropolitano de la Habana



Industrial Parks		Forest Farms		Private Farms	
Buildings to maintain		Multi-Crop Farms		Forest Areas	
Amusement Areas		Nurseries		Reafforestation terraces	

Agricultural activity is located mainly in the municipality of Marianao and almost exclusively in Pogolotti-Belen-Finlay People's Council No. 5. This is a periurban area of great racial and cultural diversity.

Currently, agricultural and forestry activity in the PMH appears in three forms:



The 88.4 ha currently used for urban agriculture are distributed in the following manner:

Urban Agriculture	Total	Area	
		(ha)	Producers
PMH Agroforestry Farm	43.8	40.6	18
Nguyen Van Trói CCS	42.9	36.2	50
Dispersed Farmers	1.7	1.7	28
TOTAL	88.4	78.5	96

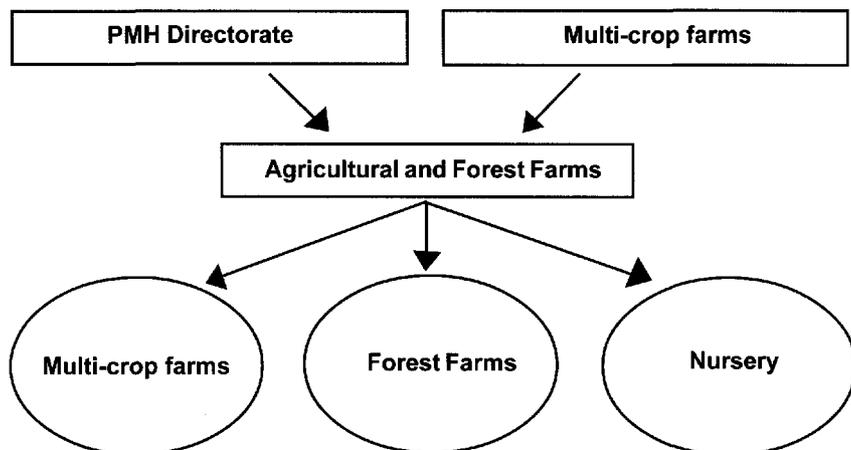
Source: PMH Agroforestry Farm and Nguyen Van Trói Credit and Services Cooperative (Nguyen Van Trói CCS).

The Parque Metropolitano de La Habana Agroforestry Farm

The PMH Agroforestry Farm was created to implement the Agroforestry Programme. It is under two authorities: methodologically under the PMH Directorate and administratively under the Havana Multi-Crop Company, located outside the PMH area and part of the Ministry of Agriculture Local Office.

The Farm's management and services are the responsibility of seven people: a farm manager (agronomic engineer), a technical consultant (geography baccalaureate), an economic Development Manager (intermediate technician in economics), a Human Resources Manager (intermediate technician in labour organization and salaries), a Warehouse Manager, an Agricultural Equipment Operator and a Mechanic.

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The Agroforestry Farm supervises:

Activity	Number of farms	Total area (ha)	Cultivated area (ha)	Number of workers
Multi-crop and flower farms	5	24.0	21.6	10
Tree farms	3	16.2	16.2	4
Nursery	1	3.6	2.8	4
TOTAL	9	43.8	40.6	18

Source: PMH Agroforestry Farm.

The farm has 25 workers in total. Some 72 per cent of them are directly involved in production, representing 19 per cent of all 129 PMH workers.

Of the farm's 25 technicians and workers, 20 per cent are women. There is only one woman directly involved in production. Four women belong to the Management and Control Team, representing 57 per cent of its members. This is in keeping with the pattern of these indicators in Havana.

It is important to note that not all PMH workers officially appear as a staff member. Some of them are administratively related to other bodies, such as the Multi-Crop Company, the Communal Services Branch, the Ministry of the Interior (forest wardens) and others.

The Agroforestry Farm's age distribution shows the following:

Age groups	Management and Services	Farm workers
18–25	2	–
26–59	5	12
60 and over	–	6
TOTAL	7	18

Source: PMH Agroforestry Farm.

It can be seen that only 8 per cent of farm workers are under 25, and they work in management and services. Workers between 26 and 59 constitute 68 per cent, while 24 per cent are older adults. Although most workers are adults, there are also job opportunities for older adults, specifically in direct production work. The latter corresponds to the employment needs of this growing age group and the opportunities this activity offers regardless of the individual's education or experience.

Upon assessing the workers/ha indicator, the following results are observed:

	Workers/ha
Total workers/total area	0.57
Direct producers/total area	0.41
Total workers/cultivated area	0.61
Direct producers/cultivated area	0.44

As stated above, the PMH's agricultural area has periurban features and the structure of farms is typical of the farming sector. Therefore, the provincial field worker indicator (0.5 producers/ha)⁵ is used, which shows a similar pattern when applied to the direct employees of the Agroforestry Farm.

The Agroforestry Farm received funding through three channels:

1. PMH Budget Technicians' salaries
2. Multi-crop Company Agricultural workers' salaries. Supplies.
3. External Cooperation Farm development. This funding is received through the PMH.

Each farm, including the nursery, is authorized for use free of charge, and has a manager who decides how many people to hire. On average, they are:

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Multi-crop farms	2 workers/farm
Tree farms	1.3 workers/farm
Nursery	4 workers

In all cases, the workforce is not very stable, which is related to the attraction of the nearby city and the fact that the workers still do not have, as will be seen below, sufficient economic benefits motivating them to remain at their jobs, especially those working on the multi-crop farms.

The farm workers, including those at the nursery, receive a basic monthly salary in the following manner:

Category	Monthly salary (in Cuban pesos)
Farm manager	265.00
Agricultural worker	225.00

Source: PMH Agroforestry Farm.

In addition to this basic monthly salary, farm managers and workers receive an incentive, depending on the following:

- **Multi-crop farms.** Marketing excess production, after production quotas have been met.
- **Tree farms.** The seedlings of trees planted and harvested annually and their maintenance, once the money received for these activities covers the salary debts with the Multi-Crop Company.
- **Nursery.** 5 per cent of the nursery's total annual sales is allocated to worker incentives.

Of the nine farms, including the nursery, three have houses for the farm managers. One was built and two were renovated with the support of cooperation projects. The farm managers and their families live in them. The remaining farms only have sheds for storing materials and supplies. There is the intention to build one house per farm, which is a means of encouraging farm managers to remain at their jobs.

It is important to emphasize that:

- All workers directly involved in production live in the PMH territory (90 per cent) or immediate area (10 per cent).
- Of the family members living on the farms, only the farm manager is directly involved in agroforestry activity. The rest study and/or work outside the PMH.

Until March 2001, the Agroforestry Farm had only one tractor in poor condition that served all the farms, including the nursery, through collective planning. This tractor is currently being repaired and a new one that will work in the same manner was purchased. This service is paid for by the farm managers. They buy products offered by the Multi-crop Company. Resources coming from external cooperation are given as a donation.

Productive aspects of the Agroforestry Farm:

Main crops and area cultivated in 2000

Crop	Area cultivated (ha)
Sweet potato	2.3
Squash	1.7
Chinese cabbage	0.5
Beans	1.5
Lettuce	1.8
Cucumber	0.9
Plantain	1.9
Tomato	1.5
Yucca	2.3
Okra	0.9
Maize	0.4
TOTAL	15.7

Note: These figures include crops planted throughout the year. The same area was planted more than once, which accounts for the difference between the total and the cultivated area.

Multi-crop Farms

There is very poor crop diversity, which is due in part to insufficient crop interplanting, crops that require more time such as plantain and yucca, and the significant amount of time spent preparing the soil, including fallow periods.

Flower cultivation began in 2000, occupying the following areas by variety:

Variety	Area cultivated (ha)
Aster	0.5
Sunflower	3.5
Gladiolus	1.0
Marigold	2.0
TOTAL	7.0

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Flowers are grown on only three of the multi-crop farms and the area set aside for this activity is different. On one farm, approximately 80 per cent of the area is set aside for flowers, while on the other two a little over 25 per cent is set aside.

Each of the multi-crop farms uses timber and fruit trees to mark its boundaries and internal fields.

Cooperation projects have made it possible to have a yoke of oxen to plow the field and an irrigation system on four of the five multi-crop farms. The irrigation systems have not been used to their full potential because of limitations concerning the quality of water sources.

A small number of pigs and poultry are raised on the farms, mainly for the workers' own consumption, usually by farm managers in their backyards.

Summary of multi-crop farms

	1998	1999	2000
Production in quintals (various crops)	1,123.0	1,137.0	2,648.8
Production in kilograms (various crops)	51,045.4	51,681.8	120,400.0
Production of flowers (dozens)	–	–	13,692.0
Number of farms	3	5	5
Total area	15.0	24.0	24.0
Area cultivated	13.5	21.6	21.6
Number of producers	5	10	10

Source: PMH Agroforestry Farm.

Average yield of various crops and flowers

	1998	1999	2000
<i>Various crops</i>			
Area cultivated	13.5	21.6	14.6
Yields (kg/ha)	3,781.1	2,392.7	8,246.6
Production/producer	10,209.1	5,168.2	12,040.0
<i>Flowers</i>			
Area cultivated	–	–	7.0
Yields (dozens/ha)	–	–	1,956.0
Production/producer	–	–	1,369.2

Source: PMH Agroforestry Farm.

As the figures in the table above show, the year 2000 marks what could be called the beginning of consolidated production on these farms, since the number of farms remains the same, as does the area cultivated. Meanwhile, the increase in total production is directly related to the increase in yields, which is almost 3.5 times higher than in the previous year.

Flower production also began in 2000. The decision was taken because this crop generates immediate income, which these farms need.

On comparing the results of multi-crop production (excluding flowers) with the average number of field workers in Havana in 2000, the following is observed:

	Estimated yield (kg/ha)	Production/producer (kg/producer)
Field workers	27,096.0	75,751.9
PMH farms	8,246.6	12,040.0

Source: PMH Agroforestry Farm.

The indicators for the PMH multi-crop farms represent 30.4 per cent of yields and 15.9 per cent of the average production/producer ratio for the city's field workers. The assessment conducted by the Agroforestry Farm determined the following as possible causes of this marked difference:

- The lack of agricultural knowledge among Agroforestry Farm producers, demonstrated by long periods without planting and poor management of land, crops and resources.
- The fact that agroforestry activity in the Parque Metropolitano is in the promotion stage.
- The organic techniques used require more labour.
- Produce is not always weighed.

It is certain that the PMH indicator could rise a little more if flower production on multi-crop farms were taken into account. However, the assessment also clearly showed that, as in the study conducted in the Camilo Cienfuegos area, an analysis of greater scope was advisable to validate the information at the municipal level.

If flower production for 2000 is compared to the production quota for 2001 (22,000 dozen), a notable increase of 160 per cent can be seen. The Agroforestry Farm has determined that soil and climate conditions are suitable for this crop. It has therefore decided to increase the flower production area on the multi-crop farms for 2001. At the same time, it has suggested increasing multi-crop farm production by 66.2 per cent (181,818.2

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kg), which represents a significant rise in resource efficiency and a much more intensive use of agricultural land.

It must be stated that this increase in the production quota for multi-crop farms does not reflect an analysis of its real potential, but rather a quota established by the Multi-Crop Company.

It is interesting to note that, although the prices at which the Flower Company buys the Agroforestry Farm's production have been assessed as low, when the Farm complies with the company's production quota it allows producers to sell excess production directly at the farmers' market, where flowers sell at a very good price. This is an important economic incentive.

The Agroforestry Farm stores and markets the production quota with the Flower Company and pays the money earned to the Havana Multi-Crop Company.

Tree Farms

Trees planted on PMH land

	2000	2001 Quota
Trees planted in the PMH	20,000	32,000
Timber trees	17,000	21,000
Fruit trees	3,000	9,000
Hedge trees		2,000

Source: PMH Agroforestry Farm.

The number of trees planted by tree farms (8,700) represents 43.5 per cent of the total planted in 2000. For 2001, these farms plan to plant 7,200 trees, or 22.5 per cent of the quota. This reduction corresponds to the area occupied by farms. However, it is important to indicate that the farm manager can request an increase in the farm's area once the total area of the initial farm has been reforested.

The rest of the trees planted are linked to municipal reforestation plans. These trees are planted through volunteer work performed by workers and students of institutions and agencies located on PMH land and its immediate vicinity, such as the José Antonio Echeverría Superior Polytechnic Institute, the Blas Roca Contingent, the Ministry of the Armed Forces, the University of Havana, and others.

Nursery

The nursery was conceived to supply plants (fruit, timber and ornamental trees) to the park for reforestation and possible sale to the public and agencies to make the activity more profitable.

Located near the Almendares River, it has offices, latticework shelters, plant production areas, and other facilities. This nursery is also linked to the Environmental Education Programme, since it can receive visitors for demonstration and education purposes.

Although there are currently four workers at the nursery, at one time there were as many as 12. While this reduction was influenced by the instability of the workforce, the analysis done showed that the nursery's actual labour requirement is six agricultural workers.

With regard to the above, it is important to indicate that the PMH maintains an employment policy in keeping with the national one, where occasionally providing employment for disadvantaged people living in the area is given priority over the agency's economic needs (for example, single mothers, ex-convicts and others).

There is no house for the manager at the nursery, but all of the workers live on PMH land.

The nursery ensures that the need for seedlings is met for the reforestation of PMH farms and the reforestation plans of the four municipalities throughout its territory. Excess production is marketed in the public and industrial sectors.

Seedling Production

	2000	2001 Plan
Production of nursery seedlings	80,000	90,000
Fruits trees	40,000	20,000
Timber trees	40,000	70,000

Source: PMH Agroforestry Farm.

It can be seen that 25 per cent of the total seedling production in 2000 was planted on PMH land. The rest was sold to MINAGRI to meet the needs of the municipal reforestation plans and other state and private agencies that requested it.

Water and Organic Matter Recycling

Water sources for irrigation identified in the PMH are the Mordazo and Santoyo streams, with a high potential for irrigation, and two lakes

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located on two of the multi-crop farms. There is also a pluvial drainage canal in the area that is used for this purpose and, very sporadically and only in cases of extreme necessity, water from the population's supply network is also available.

At present, approximately 63 per cent of the area farmed is irrigated using the sources mentioned above. Analyses of water quality performed recently determined that it is suitable for irrigation. Nevertheless, the Agroforestry Farm has decided that it should continue to search for alternatives that increase the provision of water for irrigation.

The principal sources of organic residues in the PMH are domestic residues and plant biomass produced naturally and as a result of maintaining green spaces. However, its use is insignificant and therefore it is identified as a weakness of the PMH Project. The volumes of wastes are significant and constitute an appreciable future potential. It is enough to state that the generation of domestic wastes has been estimated between 7.2 and 10.8mt/day, of which 70 per cent are organic.

Forms of Marketing and Incentives at the Agroforestry Farm

Multi-crop Farms

As stated above, each of the farms has a production quota. This production quota is valued according to the prices per crop set by the Multi-Crop Company.

Producers are also authorized to sell directly on the same farm and in the Agroforestry Farm's sales outlet (Calle 51 and 76, Marianao) at market prices, and always at a prices lower than farmers' markets.

From the sales results, the producer must pay the value of his or her production quota and debts (salaries, supplies) with the Multi-Crop Company.

To date, the farms' earnings have kept in line with their expenses. Therefore, although they are profitable, they have no profits, nor is there any incentive beyond the workers' basic salaries.

The farm's management workers should receive an incentive equivalent to 10 per cent of income generated by the multi-crop farms from the Multi-Crop Company, but these earnings have not been produced to date.

Occasionally the farms, through the Agroforestry Farm, make donations to daycare centres or primary schools.

Nurseries

It is estimated that about 80 per cent of the nursery's production is reserved for municipal reforestation plans. The MINAGRI Local Office in Havana buys the seedlings at the official prices listed, which are considerably lower than those at the Agricultural Support Stores. For example, the nursery sells a guava seedling to the municipalities at 4.00 Cuban pesos because this is the price paid by the Ministry of Agriculture Local Office. The nursery sells the same seedling to state-owned companies and the private sector at prices ranging from 5.00 to 10.00 Cuban pesos, and at even higher prices to the Agricultural Support Stores (15.00 Cuban pesos).

The same thing happens with timber tree seedlings. The nursery sells a timber tree seedling at 0.36 Cuban pesos to the municipalities, paid by the Ministry of Agriculture Local Office. The same seedling is sold to state-owned and private sector companies at a price ranging from 2.00 to 3.00 Cuban pesos according to the species.

From the total sales income, the Multi-Crop Company allocates 5 per cent as incentives for nursery workers, which in 2000 accounted for approximately 500.00 Cuban pesos a year per worker, equivalent to 42.00 Cuban pesos per month per worker in addition to the basic salary.

Incentives at Tree Farms (not related to sales)

The main expense for tree farms is salaries, as most of their supplies come from donations.

Three years after establishing the farm, a commission made up of representatives of the Multi-Crop Company, the PMH Directorate and the MINAGRI Local Office carries out an inventory of the trees planted in that period and pays the farms for each tree, according to the species and a price list established by MINAGRI. It also pays for maintenance costs. Payment for trees planted is made every three years and maintenance work is paid annually.

If the loss of a plant is detected during the triannual inventory, the money paid to the producer becomes an expense in the new triannual period.

To date, only one farm has completed the first establishment period and its income reached 9,258.00 Cuban pesos. However, the farm's salary expense for one year was 10,483.00 Cuban pesos (for the farm manager and one agricultural worker, plus vacation time and social security for both), resulting in a deficit of 954.43 Cuban pesos. As a consequence, there

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is still no incentive beyond the basic salary for either farm managers or workers.

It has been established that the main problem of reduced income lies in the very low prices paid for planted trees and maintenance work. This does not reconcile at all with this activity's priority and explains in part the instability of the workforce on these farms.

The farm's profit in this respect is the reforestation of the Parque Metropolitano de La Habana Project's land.

Producers' Assessments

In the first year of research, after interviewing 18 producers who worked at the Agroforestry Farm at the time, it was determined that they associated their work with:

	Percentage
Salary	100
Recreation	36.3
Saving money	63.6
Public consumption (schools, hospitals and other)	27.2

Eighteen months later, in interviews with similar objectives, it was discovered that 100 per cent of direct workers interviewed (15) benefited from the produce obtained for family consumption and 80 per cent recognized this as a means of saving money. Only 33.3 per cent considered the salary earned to be an incentive in their work.

On the other hand, 26.6 per cent were aware that their work was involved in contributions to institutions such as schools, daycare centres, hospitals and others. Some 46.7 per cent stated that they took pleasure in their work beyond the material benefits obtained.

It is evident that there is currently an increased interest in agriculture relating to the pleasure taken in the activity and recognition of the material benefits it brings to the family by making food available and saving money. However, in practice, no permanency can yet be seen in the activity, which is influenced by the income problems (salaries, incentives) mentioned above.

The Agroforestry Farm's Maintenance and Development Perspectives

Since 1999, the PMH Directorate initiated a restructuring process in which it proposed changing its status as a budgeted unit to that of a

company. While having its limitations to attracting external financing this change, yet to be approved, will allow a greater economic independence for the activities currently being established in the area and a greater availability of resources that could be reinvested in the project's implementation.

This proposed change is, without doubt, the result of a working process in which the income-generating potential of the various activities located in the area were progressively identified. The education of the PMH technicians on the Research Team and the capacity-building they provide had a significant impact on this identification.

Agroforestry stood out as one of the activities with the greatest income-generating potential. The change in status to a company would allow, among other things, the current subordination to two different authorities to be eliminated and enable the PMH to keep the earnings it now gives to the MINAGRI Multi-Crop Company, as well as to set prices for selling produce.

Proposal of the PMH Company's Agroforestry Economic Unit

The Agroforestry Economic Unit's (UEAF) main economic objective is to create a green lung in the capital using 80 per cent of its land for reforestation, agricultural development and gardening. To do this, it must:

- Achieve an annual production of 4,435 quintals (qq) (197,500 kg) of starchy root crops, fresh vegetables and grains.
- Maintain an annual production above 80,000 seedlings of timber and fruit trees.

Other Objectives

- Making the farm profitable by increasing production on agroforestry farms.
- Reaching a rational and optimum level of use of land, material, and human and financial resources.
- Boosting productive potential, mainly plantings of varied crops, fruit and timber trees in ecological and landscaping conditions to meet the population's growing demands.
- Ensuring the achievement of the land's maximum productive possibilities, taking into account its features and potential and applying intelligence, technological efforts, etc.
- Obtaining high yields.

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- Guaranteeing that the agricultural production of its farms reaches the population with the required quality, appearance and freshness.
- Ensuring the planting, care and harvest of the produce that must be supplied all year long.
- Achieving worker incentives through the results obtained on the farms.

Basis for Applying the Payment and Incentives System

- Producers must apply the technology established for each crop.
- Each farm must have the necessary number of producers, depending on its size and type of crop.
- Farms will be represented by the farm manager.
- Each farm will prepare a production quota that takes into account the volumes and supplies determined in direct consultation with the UEAF. Both parties will assess the prices in effect and the amount of products delivered by the farms.
- The UEAF must have a system of incentives and food assistance similar to that of the Havana Multi-Crop Company.
- The UEAF must have a marketing section where all of the farms' produce will be received and sold and where the farms' earnings will be determined.
- The UEAF will guarantee compliance with the principles of the state-owned companies' Farm System.
- The UEAF will establish a control system for each farm's economic and productive results.

Features of the Payment and Incentives System

For farm workers. This consists of a payment on time of \$225.00 per month for workers, \$265.00 for the farm manager and a periodic incentive deriving from the income earned from the sale of produce.

Of the amount to be distributed, 50 per cent will go to worker incentives and the remaining 50 per cent to the UEAF. Expenses (including salary, vacation, social security, supplies and loan repayment) will be deducted from the 50 per cent going to workers.

For UEAF workers. Each manager, official, technician or worker will be paid for his or her position in the form of payment established in current legislation and will participate in distributing up to 10 per cent of earnings according to the results of his or her work.

The earnings of all of the farms are considered UEAF earnings for the cafeteria and other items.

It has been determined that, apart from these changes, PMH management and Agroforestry Farm producers and workers should benefit as well. It is necessary to seek greater connection with the remaining producers located in the area, especially those of the Nguyen Van Troi CCS.

Nguyen Van Trói Credit and Service Cooperative

The Nguyen Van Trói Credit and Service Cooperative (CCS) is an association of field workers and farmers who use the land they cultivate free of charge. The cooperative has 57 members, 28 (49 per cent) of whom are landholders (field workers and farmers) residing in the PMH area. Nine (15.7 per cent) of the members are women and, among them, four (7 per cent) are landholders (producers).

The cooperative has a Board of Directors comprising seven members, three of whom are women, and its own charter governing its operations. The Producers' Assembly is the highest decision-making body comprising 100 per cent of the cooperative's members. The average age of the members is 49 and their involvement in the cooperative is stable.

This CCS is an autonomous, self-managing association of producers and is currently profitable. It includes 28 farms varying in size between 1 and 8 ha. Of the total number of farms, only 3 (10.7 per cent) are private property.

The remaining areas are considered a collective hectare that is farmed intensively to generate income entirely for the cooperative's operation. This area has an irrigation system and is mainly used for growing fresh vegetables.

Summary

Total number of producers	28.00
Total area	42.90
Area under cultivation	36.20
Average producers/farm	1.00
Total number of producers/area	0.65
Producers/area under cultivation	0.77

Source: Nguyen Van Trói CCS.

Note: The figures for the areas are in hectares.

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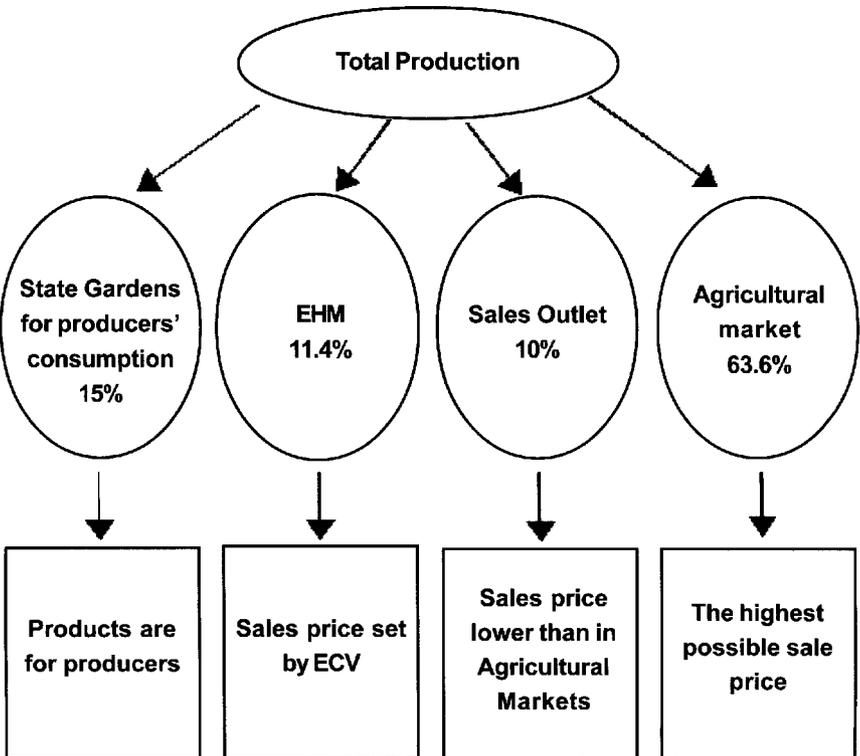
It is important to mention that the rest of the cooperative's members (29) are involved in production, but not permanently, and therefore are not considered producers.

Established Crops and Allocation of Production

The CCS had proposed a production quota of 24,000 qq for the year 2000, which was met by 109 per cent. Total production at the end of this year was 26,300 qq (1,195,454.5 kg).⁷

The allocation of this production was:

Allocation	Volume (kg)
Consumption by the producer	179,318.20
Sales to EHM by contract	136,363.60
Sales in CCS sales outlet	119,545.45
Farmers' market	760,227.30



On comparing the results achieved in the year 2000 by the field workers of the city of Havana, the Nguyen Van Trói CCS and the PMH multi-crop farms, the following can be seen:

Form of production	Estimated yield (kg/ha)	Estimated producers/ha	Estimated production per producer (kg/producer)
Havana field workers	27,096.0	0.50	75,751.9
Nguyen Van Trói CCS	33,023.6	0.65	42,694.8
PMH farms	11,358.5	0.44	12,040.0

The yields achieved by the Nguyen Van Troi CCS were above the city of Havana's average. However, the production per producer equals 56.3 per cent of the same, which may be in part because it employs more workers per ha.

Production of the main crops established in the Nguyen Van Troi CCS's areas is as follows:

Crops	Production
Fresh vegetables	24,000 qq (1,090,909.0 kg)
Grains	800 qq (36,363.7 kg)
Tubers and Fruits	1,500 qq (68,181.8 kg)
Flowers	156,000 dozen

Comparison of flower production yields

	Yields (dozen/ha)
PMH multi-crop farms	1,956
Nguyen Van Troi Cooperative	22,285

Source: Nguyen Van Trói CCS.

Note: The area for growing flowers in the CCS is 7 ha.

A marked difference is seen between the yields achieved in flower production on the PMH multi-crop farms and in the Nguyen Van Troi CCS. This difference is due to the greater experience of the CCS producers and the fact that they plant high-yield varieties such as asters.

Among the fresh vegetables, lettuce, okra, eggplant, different varieties of tomato, cabbage, beet, turnip, carrot and parsley predominate. Among tubers and roots, sweet potato, yucca, plantain and squash are notable. Among fruits, guava, lemon and coconut are dominant. Maize predominates in grain cultivation.

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In the year 2000, the CCS sold 5,700 l of cow's milk for the first time to the dairy industry. For 2001 it has a sales quota of 10,000 l of milk. Some 21 per cent of producers supply milk to the industry and the rest have cows (generally one per producer) for their own milk consumption. The average yield achieved by producers supplying the industry is estimated at 5 l per cow milked.

Livestock production has a prominent place in the CCS's agricultural production, although it is not always considered in assessment indicators, in part because most of it is used for family consumption. However, its existence supports and complements plant production, which is reflected in the preparation of organic fertilizers such as compost and/or worm humus on the farms, supplying 20 to 60 per cent of their fertilization needs. However, they still receive a certain amount of agrochemicals from MINAGRI, such as fertilizers and pesticides, mostly for flower cultivation.

Species	Use:		Amount
	Consumption by producers	Industry	
Pigs	x	x	80
Horses		Work, Transportation	11
Dairy cattle	x	x	54
Oxen		Work	10
Goats	x		8
Poultry	x		1,200
Sheep	x		102
Rabbits	x		43
Beehives	x		14

Source: Nguyen Van Trói CCS.

The CCS also produces ham which is sold mostly in the farmers' market and is the only form of local small industry carried out in the PMH area.

In recent times there has been an effort to rescue traditional fruit trees. Approximately 2,300 guava, coconut, custard apple, soursop, cashew, sweetsop, avocado and mango trees have been planted in CCS areas. One producer is also rescuing mung bean production.

Water sources used for irrigation are one spring, five microreservoirs and three wells located on farms. The irrigated area is 13.4 ha in size, representing 37 per cent of the cultivated area. Water from the Almendares River is not used as it is not considered to have the required quality for irrigation. Water from the population's water supply network is practically never used due to established restrictions. It is evident that there is a lack of available water, resulting in part of the production being dry-farmed.

The Credit and Service Cooperative's (CCS) Maintenance and Development Perspectives on the Parque Metropolitano de La Habana Project

It should be noted that of the CCS's 28 landholders, 10.7 per cent are landowners (field workers who have owned the land since before 1959) and 89.3 per cent are farmers authorized to use the land (provided by MINAGRI) free of charge who have been doing so for more than 26 years. This stability indicates a level of permanence for the producers and the acknowledgement of institutions involved in the city's agricultural activity.

The assessment carried out by the CCS Board demonstrated its interest in forming part of the PMH project in order to express its views.

If we take into account the 24 ha occupied by the PMH's multi-crop farms and the CCS's 42.9 ha, the total is 66.9 ha. The PMH has proposed keeping 60 ha reserved for urban agriculture in the future, and therefore the figures do not currently present great contradictions. However, there is the intention to increase the number of the PMH Agroforestry Farm's multi-crop farms, indicating that, in some measure, part of the CCS's area will have to be used in the future for tree planting.

This situation must be resolved progressively, to the extent that relations between the Agroforestry Farm and the CCS transcend the framework of independent relations and the integration the activity demands is achieved.

Dispersed Producers in the Parque Metropolitano de La Habana

The 28 dispersed producers identified throughout the PMH territory more closely resemble the type of producer found on plots in the city. Although there are more of them than PMH Agroforestry Farm producers, they occupy small areas between 70 and 1,000 m². They are not organized in any way, and therefore information about them has been limited.

These producers plant a limited number of crops for their own consumption, mainly rice, plantains and taro. They sporadically plant tomatoes and lettuce for sale.

Of the information obtained about these producers, the most significant is that:

- They generally work in small groups of two to four people.
- Approximately 40 per cent have outside employment.
- More than 50 per cent are over 60 years old.

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- Most report having always planted in the same place and others have moved through various areas of the park.
- All of them belong to low-income families.
- They do not know how much they produce, but state that in some cases they satisfy between 60 per cent and 70 per cent of the household's need for rice and plantains.
- They farm during the dry season and at the start of the season some burn areas for farming.
- Most farm for three to six years.
- Out of all the producers, six grazed sheep and/or goats and three of them planted crops as well. The number of herds fluctuates between four and 16, including the young animals. None of these producers participate in the regular workforce.

These producers demonstrate a low exploitation of the areas they have been spontaneously occupying and their results are typical of subsistence agriculture, which shows a lack of care for them. However, they are a group that is interested in agricultural production and therefore constitute a potential that may be integrated through training and guidance on the PMH's environmental and economic demands, and at the same time will be more prepared to satisfy their own needs.

General Considerations

It is evident that from 1998 to the present important progress has been made in establishing the PMH Agroforestry Farm, particularly regarding the creation of multi-crop and tree farms, as well as the nursery. A progressive growth in tree production and planting can also be observed. All of this is in line with the general interests of the park with a view to establishing urban agriculture for economic and environmental education purposes and planting 80 per cent of its territory with timber and fruit trees.

This process has also enabled the potentials of self-financing to be identified and a change proposal (from budgeted unit to company) to be prepared that will make possible the availability and management of resources within the organization. This level of local economy must cover park services and the expenditures the project requires.

The fact that the Agroforestry Farm now has a technical and productive force that is far more trained for the project's development has an important

impact on the above. The participation of some of the technicians in the Research Team has contributed to this training.

However, the dependence to date of the PMH Directorate, and particularly the Agroforestry Farm, because of its subordination to the Havana Multi-crop Company, the sale prices they are subject to, the subsidy of many supplies and the application of a production quota established apart from the most integral features and interests of the PMH, creates not only an appreciable level of weakness in the undertaking, but also a significant limitation to consolidating a local economy of its own.

These weaknesses are apparent in progress that has been slow and characterized by encouraging the use of available local resources, which has left its mark on the people involved in the PMH project. They currently rely on applying general solutions to solve problems. An example of this is the existence of only one model for multi-crop farms and tree farms.

Weaknesses are also clearly seen in the insufficient economic incentive for producers to remain, as well as in the low level of technology achieved by the farms, especially the multi-crop farms. Examples of the latter are the failure to improve soils, the limited crop diversity and absence of crop and livestock integration.

There is also little coordination between all the forms of production present in PMH territory. Even when, at the beginning of the park's agroforestry development, inclusion in the project by one means or another of all producers working on it was envisioned, neither the Agroforestry Farm nor the PMH Directorate have developed a concrete working strategy that incorporates the Nguyen Van Trói CCS and dispersed producers in practice.

This situation, in another context, may not have great implications for the development of a local economy. However, as has been said many times, there is only one PMH territory and it is subject to a project with very specific objectives and interests, especially regarding the participation of all actors. It may be necessary to deal with these problems in greater depth, in order to create a progressive process of change and avoid exclusions in the longer term.

Something that merits special attention is the fact that agroforestry operates in the PMH under the same structures and systems as large-scale agriculture. It is sufficient to indicate that the Farm System of the MINAGRI Havana Multi-crop Company is applied to the Agroforestry Farm, and it is proposed that in the new structure this system will continue

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to be applied. The Nguyen Van Troi CCS is structured and operates under conditions that are established for the national CCS system.

It must be asked whether a city park that aspires to having novel forms of urban agriculture harmoniously incorporated into the park's green space, with such diverse objectives as environmental education and local economy, can adequately function within structures that are applied to other contexts and where other actors, with other objectives, participate. In our opinion, the challenge lies in finding, in a participatory manner, what the undertaking still requires beyond producing food and obtaining capital.

Notes

1. Harahí Gámez Rodríguez. *Diagnóstico de la situación y características de la Cooperativa de Producción Agropecuaria Vicente Pérez Nao*. Thesis. University of Havana, Faculty of Geography, 1995.
2. Ibid.
3. Ibid.
4. Workshop 'La agricultura en el Parque Metropolitano de La Habana'. Papers. February 1996.
5. See the section Efficiency Level of Urban Agriculture's Direct Forms of Production in Chapter III.
6. Parque Metropolitano de La Habana. Propuesta de estructura de la Unidad Económica Agroforestal. Havana, September 1999.
7. PMH. Nguyen Van Troi Credit and Services Cooperative.

Chapter VII

IMPLEMENTATION OF THE STUDY IN THE CAMILO CIENFUEGOS PEOPLE'S COUNCIL ZONE*

This chapter discusses the land features of one of the areas currently under study and its land availability for housing development. The different forms of urban agriculture and their development within their integration and consolidation process in the area are also presented.

The research, as discussed in this chapter, brought about the participative proposal and implementation (local government, citizens and producers) of specific actions in regard to irrigation solutions and organic matter recycling, both important components in urban agricultural development, as well as its beneficial relationship to the urban environment.

Most importantly, the needs and demands for urban development planning integration and the new needs of the inhabitants and the agricultural production are presented, and their growing role in raising the quality of life and establishing the local economy are considered.

* Yalila Murciano Guerra, Francisco Lestegas Pérez, Dalgys Sosa Ruiz and Lourdes Álvarez Hernández collaborated in the writing of this chapter

Background

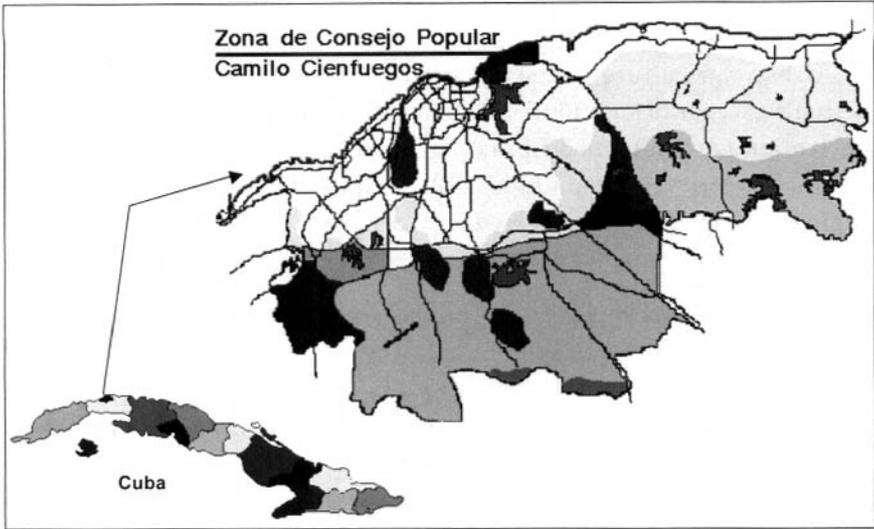
The city of Havana has had and continues to have two possible spatial development areas for new housing construction: the existing free spaces found in its urbanized area and within its eastern coastal region. The city must not grow towards the south, where the Vento subterranean water basin, its principal water supply, is located, or towards the west, where one finds fertile land currently used for dairy farming.

The end of the Havana Bay Tunnel construction in 1958 significantly raised the potential – and value – of the eastern coastal area for the construction of housing, industries and tourist attractions. This tunnel, measuring more than 700 metres in length, joins the traditional city with its eastern coastal region and the rest of the country. Prior to its construction, one had to skirt the entire bay in order to reach this area.

Since 1959, two stages can be observed regarding the city's housing construction. Up until the mid-1980s, there was a trend towards new housing development. Subsequently, with the revitalization of the microbrigade movement in 1986, construction was principally aimed at filling up the existing residential areas. In 1989, at the start of the 'special period', the city presented a densely-built central region, from which extended an urban development with plots and open spaces that had never been occupied or had become vacant.

The Camilo Cienfuegos residential area, located approximately one kilometre from the Havana Bay Tunnel's eastern exit, is considered to be the first new urban development built after 1959 by the Revolutionary Government, and is, as a result, considered a national heritage site. The urban development design implemented was selected as a result of a contest organized among Cuban architects of the period. This design harmoniously combined tall and medium structures interspersed with multiple decorative green spaces. Currently, the Camilo Cienfuegos residential area is part of the People's Council zone of the same name in the municipality of East Havana.

The Camilo Cienfuegos People's Council zone, the subject of this research project, stretches from the Bay Tunnel exit, where the Morro-Cabaña Military Historical Park is located, and continues throughout the coastal area in a belt that stretches from the coast to the Monumental Route, and then ends approximately one kilometre past the Camilo Cienfuegos residential area.



Despite having a population of more than 11,000, the Camilo Cienfuegos People's Council maintains a considerable free land reserve. This is because after the 1960s, the area selected for new housing development was located in an area more to the east called Alamar, where greater housing development opportunities were available as it had not been formally associated with any previous projects. Even though Alamar has lower-quality buildings, in its time it provided a solution to the urgent housing shortage.

The undeveloped land located in the area under study has been reserved for housing development in the different development plans conceived, including the current one, with the specification that while they are not used for housing, they will be used to advantage in other ways compatible with its surroundings and not resulting in greater expenditures.

Urban agriculture began in this area in 1990. It was established as much in the west as in the east of the Camilo Cienfuegos residential area (adjacent to it). Between 1990 and 1995, five fresh-vegetable producers' clubs (Farmers' Groups), uniting approximately 152 producers were formed. No records have been found that specify the exact amount of land they occupied. In interviews conducted with ten long-time producers, they stated that they quit producing because of the thefts committed in the area, the lack of water supply and the uncertainty regarding the possibility of continuing to farm in the area in the long term. Another reason given was that when the economy recovered, their workload increased and they had little time to devote to their farms.

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Urban Agriculture Analysis

Urban agriculture in the Camilo Cienfuegos People's Council zone currently accounts for a total of 15.4 ha, distributed among an intensive-cultivation garden named El Pedregal, one of the initial clubs called El Paraíso (which has remained stable since its establishment), and approximately 62 other dispersed farmers (not organized).

This activity covers 2.8 per cent of the region's territory.

Total area of the People's Council zone (area under study)	541.0 ha
Urban agriculture	15.4 ha
Percentage of the total area	2.8 %

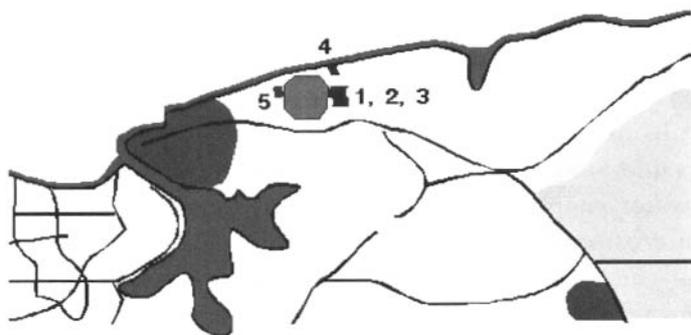
Source: Havana Provincial Physical Planning Branch and the Camilo Cienfuegos People's Council.

Distribution of the total number of hectares and the number of producers in the area under study

Map Number	Types of Urban Agriculture	Total Area (ha)	Cultivated Area (ha)	Producers
1	El Pedregal Intensive-Cultivation Garden	2.5	0.5	9
2	El Paraíso Farmers' Group	8.6	5.8	53
<i>Dispersed farmers:</i>				
3	Adjacent to El Paraíso Club	2.5	2.5	40
4	Adjacent to the coast	1.0	1.0	10
5	West of the urban area	0.8	0.8	12
Subtotal of dispersed farmers		4.3	4.3	62
TOTAL		15.4	10.6	124

Source: El Paraíso Farmers' Group Records, El Pedregal Intensive-Cultivation Garden, and the Camilo Cienfuegos People's Council.

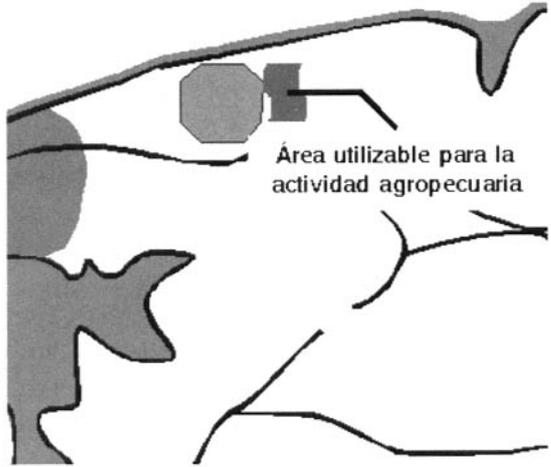
Note: The dispersed landowners' total area is the sum of the cultivated area.



As can be seen, the dispersed farmers occupy areas in three locations: some adjoining El Paraíso, others more to the northwest of the urban area near the coast, and the rest within the urban area's west side, close to the Morro-Cabaña Park areas.

The entire area used for urban agriculture is state property and was granted to the landowners for use free of charge.

By assessing the area used for urban agriculture in Camilo Cienfuegos, it can be estimated that 70 per cent of the total area, or 10.6 ha, is used for farming. The remaining 30 per cent is occupied by paths, small installations, and mainly very rocky pieces of land that require



arduous site preparation. It is important to note that the producers, the Urban Municipal Farm and the People's Council have found a potential area of 26.0 ha ideal for agricultural activity in the eastern part of the Camilo Cienfuegos residential area. Among them, 13.6 ha are occupied by El Paraíso, El Pedregal and dispersed farmers, leaving 12.4 ha that remain undeveloped.

More specific features related to production techniques are discussed below.

El Pedregal Intensive-Cultivation Garden

The El Pedregal Intensive-Cultivation Garden is located at the entrance of the Camilo Cienfuegos residential area, along its main route near residential buildings and very close to a General Hospital that provides service to the East Havana municipality.

The land presently occupied by the Intensive-Cultivation Garden was informally used for baseball practice and was selected in 1994 for use as a high-yield urban garden (HUYR).² This last project was never fully implemented, owing mainly to the difficulties encountered with regard to water supply for irrigation purposes. Nevertheless, the land had agricultural potential and has been used for this purpose since then.

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El Pedregal occupies a total area of 2.5 ha (its land area is in keeping with the space stipulated for a HUYR), of which 90 per cent can be farmed. Until now, the maximum area that has been farmed is approximately 0.5 ha, because of the very rocky soil (from which the Intensive-Cultivation



Garden's name derives) and because it is not very deep and has a limited capacity for water retention.

In addition to the above, it is worth noting that the water used for irrigation purposes comes from the population's water supply network, and the increase in its use for those purposes depends solely on the authorization of the Provincial Aqueducts Directorate. All of these problems are gradually being solved, which has allowed this land to be obtained for farming.

In the beginning, seven workers, two custodians and five workers directly involved in production were employed full time at El Pedregal. Currently, there are nine employees: two custodians and seven others directly involved in production. The number of workers has increased in response to the need to progressively enlarge the cultivated area.

The workers are organized through a Cooperative Production Basic Unit (CPBU). Four of them live in Camilo Cienfuegos, two in Alamar, two in Casa Blanca and one in Reparto Bahía. All of these neighbourhoods are relatively near to the Intensive-Cultivation Garden. The five workers who live outside Camilo Cienfuegos commute between 4 and 10 km by bicycle very early in the morning and very late in the afternoon. This shows that there exists enough incentive in their work, since they have been doing this for three to five years.

Four of the workers are between the ages of 19 and 25, two between 26 and 40, and the remaining two are over 65.

There is one woman working at the Cultivation Garden, an agricultural mechanization engineer, who is also the assistant manager.

After evaluating the producers/ha indicator, the following results were obtained:

	Workers/ha
Total workers/total area	3.90
Direct producers/total area	3.04
Total workers/cultivated area	18.15
Direct producers/cultivated area	14.11

By comparing the above figures with the indicator for the city (7.6 workers/ha in intensive-cultivation gardens), it can be seen that they are much higher, which shows a low rate of efficiency.

In the analysis carried out with the producers, they expressed that the figures had remained stable in the past two years as a result of using organic techniques for managing the area. In addition, they intend to expand the cultivated area, which requires a workforce. At this time, part of their work consists of preventing grass in the non-cultivated area from spreading and gradually improving this area. It is also noted that it is not necessary to hire outside workers during the peak periods such as the sowing and harvest seasons.

It is evident that this indicator is directly related to labour cost and the technological system used, depending on the country, region or city in question. In Cuba, the socioeconomic system gives priority to job security for those of employment age, which makes the encouragement of an activity that creates employment a positive aspect of what is being evaluated here. This does not exclude the need to make the above correspond to the efficiency that should be achieved, a component that, as has been noted, requires a long-term assessment.

It is also important to remember that the money earned by agricultural producers, in this or any other type of unit whose objective is to market its products, comes from sales. Nevertheless, even though they earn much more in comparison with any other worker paid in local currency, this does not pose a direct problem to the state. Producers themselves would be the most adversely affected by having unnecessary extra workers, since they will receive less profits while there are more workers.

El Paraíso Farmers' Group

According to the City Development Plan, the total area occupied by El Paraíso is included in the land reserved for new housing construction.

This group of 53 farmers cultivates 8.6 ha, distributed in 40 plots (each one farmed by one or two producers) with an area that fluctuates between 12 and 3 500 m².

The cultivated area amounts to approximately 68 per cent of the total area, or 5.8 ha.

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Among the landowners, 90 per cent are between the ages of 50 and 60, and the majority are pensioners, retired from the Armed Forces and the Ministry of the Interior. Only two of the 53 farmers are women, reflecting the city's overall pattern.

The above figures have remained stable in the ten years that they have been farming, because when one of the farmers retires from the group due to illness (the main cause) or any other reason, he or she is then replaced by someone who had previously shown interest in joining this group.

The Farmers' Group members do not meet regularly, but rather only do so when necessary: if they are expecting a visit, when they need to assign a plot to an interested party or to elect the best producer from the group (the one who achieves the best output and employs good land management practices). They also meet every year to set up the production quota that they will follow throughout the year.

After evaluating the producers/ha indicator, the following results were obtained:

	Workers/ha
Direct producers/total area	6.1
Producers/cultivated area	8.8

The comparison of the results achieved through these indicators with the city's average producers/ha (16.4 producers/ha) demonstrates that at El Paraíso, almost half the number of people work for the same land area, which to some extent reflects the characteristics of the actors involved: pensioners with more time to devote to this activity tend more land. This also explains in part why they have remained producers for a longer period of time.

Dispersed Farmers

These producers classified themselves as dispersed farmers since they are not organized in groups and they have practically no say in implementing the plan, nor in receiving technical assistance, training, agricultural supplies or other types of support.



This situation considerably limited the collection of information during the research process, which had to be restricted to direct observation and, when possible, conducting interviews when a producer was found on his or her plot. Responses would reflect that particular spot, as the lack of organization makes this statistical population difficult to assess.

Currently, the leaders of the El Paraíso Farmers' Group and the Urban Municipal Farm representative to the People's Council are working together to reorganize these dispersed producers.

It is known that an unspecified number of these dispersed producers belonged to the four fresh-vegetable producers' clubs initially organized in the area (excluding El Paraíso), and that the remaining producers have been joining during the past few years.

They represent approximately 50 per cent of the total number of Camilo Cienfuegos producers and, as mentioned above, they occupy 4.3 ha of land, amounting to 28 per cent of the area used for urban agriculture in the area under study. In this case, the total area refers to cultivated land and amounts to 40 per cent of the total area developed in the region for agricultural purposes.

Similar to El Pedregal and El Paraíso, the soil on the three sites, where the dispersed farmers' areas are located, appears very rocky, shallow, and with a limited capacity for water retention. These features are more pronounced in the area adjacent to the coast, where prevailing winds are also more intense, especially the northern cold fronts during the winter months. As a result, production is low and concentrated primarily in the cultivation of yucca and plantain.

Owing to its importance for comparison with the city's global analyses of the area under study, we have considered it important to indicate that:

1. The area occupied by the dispersed farmers to the west of the Camilo Cienfuegos urban area borders on the Morro-Cabaña Military Historical Park, still under construction. This is an area with access to the city and beautiful scenery, and therefore it has been decided that urban agriculture should be discontinued so that its green space could be used in a manner more in keeping with those established by the Camilo Cienfuegos Project and those that will be established later by the Morro-Cabaña Park Project.
2. The agricultural development along the coast, likewise, should be discontinued for the following reasons: which is due to the limited natural conditions favourable to agricultural activity; the fact that it

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lies on a coastal landstrip that joins the Camilo Cienfuegos and Cojímar residential areas; and, lastly, it is more appropriate for recreation than for agricultural activity.

In this way, the Quick Visual Diagnosis revealed that one of the three areas previously used for agriculture in this area has been abandoned.

3. It is without doubt that the area occupied by dispersed farmers which adjoins the El Paraíso Farmers' Group which presents the best conditions for being permanently established as an area to be used for urban agricultural activity.

In the future, this area could be treated, within a residential urban development project, as a Food Park with a wide variety of interests. The latter goes beyond a means for food security to be regarded solely as a food resource. This Food Park would include the preservation of agricultural practice, environmental practice through recycling, and design as an example of urban planning that is more in tune with our realities.

These results imply that the statistical population of dispersed farmers would be reduced to the area adjacent to El Paraíso:

	Total area	Cultivated area	Producers
Farmers adjacent to El Paraíso Club	2.5	2.5	40

These considerations would adjust the current figures of the area under study to the following:

Map No.	Types of urban agriculture	Total area(ha)	Cultivated area (ha)	Producers
1	El Pedregal Intensive- Cultivation Garden	2.3	0.5	9
2	El Paraíso Farmers' Group	8.6	5.8	53
3	Adjacent to El Paraíso Club	2.5	2.5	40
	TOTAL	13.4	8.8	102

Nevertheless, as mentioned above, the estimated area with potential for urban agricultural activity is 26.0 ha. If we consider that the producers/ha indicator reaches an average of 7, the total number of producers could rise to 180, much higher than the original and current figures.

Established Crops

The topography of the area studied in this project is part of a step-like coastal plain starting at a jagged rocky shoreline (0.5–1 m high), moving up through low flat terraces (1–10 m high) and medium and high terraces (10–47 m high) on a limestone base covered by an alluvial silt process in which underground drainage predominates.

This area is located above the North Coast groundwater basin, which is characterized by high salinity. This, together with the lack of surface water, results in limited conditions for irrigation.

Climatic conditions at Camilo Cienfuegos are greatly influenced by its proximity to the sea. The average annual temperature is 25.0°C. The coldest month is January, with an average temperature of 22.3°C, and the hottest is August, with an average of 27.6°C. The prevailing winds are from the first and second quadrants, most frequently from the NE, ENE, SE and ESE, with an average velocity of 12 km/h. Average annual precipitation is 1,133.5 mm, with 75 to 80 per cent of this occurring between the months of May and October (rainy season). The driest month is April and the rainiest is October. The average relative humidity is 78 per cent and there is an average of 7.7 hours of sunlight per day.

In addition, the north shore of the city of Havana experiences about 20 cold fronts per year that pass through during the winter season and directly affect the area studied because of their strong winds laden with salt residue.

The proximity of the coastline, the intensity of the trade winds, the salinity and aridity caused by these conditions and the predominance of thin layers of poorly developed soil with low agrop productive capacity reaffirm the difficulties in using this land for agricultural purposes.

Notwithstanding the above, it has been shown over the last ten years that food can be produced on this land. Following is a discussion of performance in this respect.

El Pedregal's Yield

Over the last two years, depending on the season, there have been stable crops of 12 to 16 species and/or varieties on average. Most of the production area has been taken up by fresh vegetables, as is appropriate to the concept of intensive-cultivation gardens.

Crops such as lettuce, cabbages and tomatoes generally account for the largest percentage because the population's demand for them is highest. On the other hand, sunflowers have occupied a significant area due to their commercial value, related to Afro-Cuban religious practices.

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The period of highest production and greatest diversity of fresh vegetables is from November to April. Average data for this period over the last two years are provided below.

Fresh Vegetable Production 1999–2000

Crops	Area planted (m²)
Sunflower	2,000
Hoop tomato	580
Lettuce	360
Chili pepper	320
Plantain	300
Campbell tomato	250
Gall oak	250
Kocros cabbage	240
Tanra cucumber	200
Celery	114
Swiss chard	80
Squash	60
Chinese cabbage	48
Hercules cabbage	40
Spinach	40
Parsley	16
Arugula	16
Chives	14
Oregano	10
Sweet basil	10
Coriander	7
Seed nurseries	5
Others	40*
TOTAL	5,000 m ² = 0.5 ha

Percentage of area planted: 20%

* Area used for crops that were only established in one of the years considered.

In the year 2000, El Pedregal achieved a total production of 1200 qq, or 54,432 kg. The above is equivalent to:

Indicator	City average	El Pedregal Intensive-Cultivation Garden	Percentage of city average
Yields (kg/ha)	119,100.0	108,864	91.4
Production/producer	15,675.2	7,761	49.5

This comparison shows yields approaching the city average, in spite of adverse natural conditions, which is in keeping with workers' intentions to consolidate the cultivated area before going on to expand it.

Production per producer is practically half that of the city average and the number of producers per hectare has a bearing on this, as was explained earlier.

It must be pointed out that in most cases production figures are estimates based on producers' experience, giving rise to a margin of error that also applies to city averages.

Established trees:

- 72 hedge trees (living fences) of mastic trees and earpod trees.
- 3 mango plants and one avocado plant.
- 30 fruit-bearing plants at the nursery stage (in bags): guava, mamey, soursop, custard apple, avocado and mango.

Almost all tree-planting activity in the Intensive-Cultivation Garden has been done to establish tree hedges. This is due to the need to set up property boundaries in an economical manner and to provide protection from prevailing winds, especially in winter. The criterion for selecting the species of trees has not been based on consideration of other uses of these plants.

The established trees fall far short of meeting the area's real needs, so it is anticipated that more trees of different species, mainly fruit trees will be planted. These would produce additional benefits through marketing the product and using land that would otherwise have little potential for intensive-cultivation crops.

Raising Small Livestock

Pigs and poultry were raised at El Pedregal in the past. Pig raising disappeared because of laws prohibiting it, but at the start of the 'special period' these laws were not strictly enforced. Poultry production ceased because it was difficult to obtain a secure supply of high-quality (concentrated) feed to maintain the stability of the flocks.

No small or large livestock is currently being raised at the intensive-cultivation garden. Producers, however, show an interest in rabbit, sheep and goat production. As with poultry, the urban and sanitary restrictions placed on raising the above-mentioned species are less stringent than those for pork production.

Pigs cannot be raised at El Pedregal, because existing conditions do not comply with the regulations established by law and enforced by the

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Hygiene and Epidemiology, Physical Planning and Veterinary Medicine Directorates: pork production is only permitted at a distance of more than three kilometres from the nearest residential building and more than one kilometre from any source of drinking water.

Challenges of the Group

Just as at the Intensive-Cultivation Garden, the 8.6 ha occupied by El Paraíso Farmers' Group is covered by a thin layer of rocky soil. In order to farm this soil, producers had to labour intensively, mostly removing rocks. They removed the rocks by hand and built approximately 5 km of stone walls more than 0.5 m high. These stone walls or enclosures, known as *cercos* in other countries in the region, also serve to mark property boundaries between the plots and form a network of internal pathways approximately 0.5 m wide. Based on observations made at various times throughout the research project, notes were kept on the established crops in 25 plots (62 per cent of the total) and on small livestock being raised in the area. (See table.)

Established crops and animals in the area

Crops	Plots	Crops	Plots
1. Salad tomato	2	28. Mexican cane	1
2. Avocado*	13	29. Lettuce	1
3. Cove grape	1	30. Melon	1
4. Leucaena	10	31. Eggplant	1
5. Oak	5	32. Grapefruit*	1
6. Squash	2	33. Sugar cane	1
7. Beans	4	34. Mandarin orange*	1
8. Banana and plantain	21	35. Sunflower	1
9. Chili pepper	1	36. Okra	3
10. Chives	1	37. Swiss chard	1
11. Mango*	10	38. Camomile	1
12. Aloe	3	39. Mamey*	2
13. Yucca	20	40. Cherry	1
14. Coconut*	6	41. Prickly pear	1
15. Sour orange*	10	42. Sweet potato	1
16. Sweet orange*	1	43. Royal palm tree	1
17. Custard apple*	7		
18. Annatto	2	Seedlings	1
19. Lemon*	2	Non-cultivated	3
20. Star apple*	1		
21. Sweetsop	1		
22. Mastic and other timber trees	14	Animals	Plots
23. Soursop*	3	1. Chickens	1
24. Guava*	1	2. Ducks	1
25. Malanga	2	3. Pigs	1
26. Citron	1	4. Geese	1
27. Passionfruit	5		

*In production.

It is interesting to note that the farmers consider it necessary to coordinate growing crops with raising small livestock, especially where raising pigs is concerned. However, existing regulations prevent this, even in cases where farms are fairly far from residential buildings and prevailing winds do not blow in their direction.

It is evident that this form of urban agriculture involves great diversity, as demonstrated by the presence of fruit trees, tubers and roots (including plantains), fresh vegetables, timber trees, medicinal plants, grains and flowers.

The dominant crops are found in the following order:

1. Fruit trees in production
2. Plantains
3. Yuccas
4. Timber trees
5. Medicinal plants
6. Fresh vegetables and herbs.

Analysis of these results undeniably shows that:

- Ten years of work has gone into planting fruit and timber trees, which demonstrates a notable trend of permanence among producers in the area.
- Producers give priority to planting crops that require little water, due to the area's lack of this resource.
- Producers give priority to crops, such as yucca and plantain, that are an important part of the basic diet.

The production quota agreed upon by the Farmers' Group for 1999 was 6,985 kg. This quota was exceeded by 10 per cent. The Farmer's Group achieved a production level of 7,683.5 kg.

On comparing the indicators achieved at El Paraíso with those estimated for the city in general, the following is observed:

Indicator	City average	El Paraíso Farmers' Group	Percentage of city average
Yields (kg/ha)	81,700.0	1,324.7	1.6
Production/producer	4,989.2	145	2.9

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This comparison demonstrates the low yields achieved by the El Paraíso farmers, which indirectly prevents them from reaching a better production per producer value, even though the number of producers per hectare is half that of the city average.

In assessing the possible causes of such low yields, it is clear that:

- Concrete natural conditions have a strong impact on production, as stated above.
- The estimated figures for production results are taken from producers' own experience. No scale or measuring tool is used.
- There are many fruit trees on the plots, which generally produce once a year. This may affect El Paraíso's average yields.

However, the difference between the average yield of city farmers and those of El Paraíso is so pronounced that even if the latter had the city's lowest yields, a more extensive analysis would be advisable to validate these estimates. To do so, it would be important to have studies of more than one area of the city and select them according to their different natural conditions, crops and other elements of interest to establish comparisons.

With regard to the above, it must be kept in mind that the city's farmers form part of a very diverse group of producers with different levels of access to technology, training and resources who work in distinct cultural and natural environments. Extending the study to several areas would mainly serve to correct flaws and achieve greater precision with a view to establishing more exact indicators.

From the commercial perspective, the value of some of these crops is not related to the volume or weight of produce (medicinal plants and exotic fruits), but rather to sales units (one package, bunch or fruit). A few grams of dried herbs can be sold at a higher price than one kilo of yucca or sweet potato. Likewise, one mamey could have a higher price than several oranges.

The above values show that yield or gross production is not an indicator that reflects the multiplicity of benefits and/or purposes of the farmers' agricultural activity. Many of the products obtained or species planted represent environmental or cultural benefits that are difficult to quantify but are equally important in assessing the city's agriculture.

Dispersed Farmers

Observations made at various times during the research indicate predominance of plantain and yucca crops and, to a lesser extent, other

tubers, vegetables, grains and herbs. In the area adjacent to El Paraíso, some fruit trees and timber trees are already in production.

The predominance of yucca and plantain indicates that the farmers seek crops that do not require irrigation or a lot of care and, at the same time, supply abundant calories to the diet.

According to the producers who could be interviewed, the lack of organization in carrying out the activity is evident in the results achieved, and therefore a less effective management than at El Paraíso is observed in these areas, as is a higher incidence of theft.

Law and Land Use

Originally, land use authorization in the Camilo Cienfuegos area came from the Electoral District Delegate. The Delegate is a (non-professional) representative elected by residents every two years. The Delegate's authorization at that time was granted directly, provisionally and free of charge to people interested in establishing community gardens, who are now called farmers.

El Pedregal, as stated above, had its origins in the area's selection for the High Yield Urban Garden (HYUG). This use of land for an HYUG, later converted to an intensive-cultivation garden, was authorized by the Electoral Delegate and a Provincial Commission made up of representatives from agencies involved in the city's management and control.

Currently, the farmers and the Intensive-Cultivation Garden are still using the land provisionally and free of charge, but there are reforms of laws concerning land use for agricultural activity. The principal reforms are the following:

- Legal authorization is obtained by registering the area for provisional use, free of charge, with the Land Registry Department of the Urban Agriculture Municipal Group. The Municipal Agriculture Commission decides whether the land should be withdrawn from use free of charge.

The Municipal Agriculture Commission comprises the Director of the Urban Agriculture Municipal Group (who presides), the Land Registrar from the Land Registry Department, the Urban Municipal Farm Manager and the municipality's President of the National Association of Small Producers (ANAP). Other institutions are also invited to participate, such as the Credit and Commerce Bank (BANDEC), the Municipal Physical Planning Directorate and the Municipal Labour Directorate.

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- Notwithstanding the above, in the operational rules of procedure of the El Paraíso Farmers' Group (drafted and approved by its members), the membership of a new producer and occupation of a new plot in its territory must be approved by the group before any other procedure regarding the matter is set in motion.
- Both the Electoral District Delegate and the Popular Council Chairperson have prior knowledge of the registration of a new plot and may express their opinions on the matter. In the event of disagreement, the authorization process is not initiated.

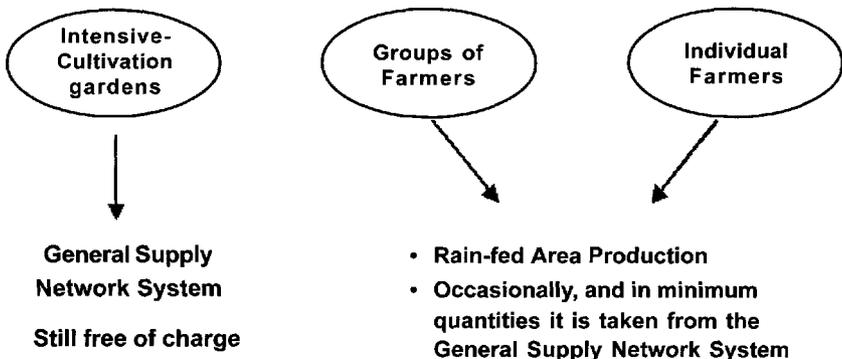
The main reasons for rescinding land use authorization for any form of urban agricultural production in the area under study are the following:

- The area is needed by the local government (municipality or province) for another given use. Example: housing construction.
- Inadequate use of the area is repeatedly observed.
- The producer to whom the plot was granted engages in share-cropping (giving it to a third party for use).
- The social purpose for which it was granted is distorted. For example, the land was granted for food production and there is an attempt to build a residence instead.

Water for Irrigation in Camilo Cienfuegos

In the area of Camilo Cienfuegos under study, there is no surface water and the phreatic water interacts with seawater, resulting in a high level of salinity. This has been proven in the existing wells, which can only be used in certain cases.

The pattern of irrigation water among Camilo Cienfuegos producers is the following:



In Havana, the possibility of charging for irrigation water coming from the general water supply network is currently being studied. It is estimated that this measure would increase the cost of production. However, to ensure that prices for produce are not affected, it is anticipated that a level of subsidy will be maintained.

It is interesting to note that a complementary study conducted in the area by a Canadian student assessed 'the willingness to pay for using land' (VDP). The average VDP was estimated at 23.5 Cuban pesos/1,000 m²/month under current conditions and at 34.4 Cuban pesos/1,000 m²/month with improved water services and protection of the area. In both cases, it is evident that producers value agricultural activity highly, as these figures represent approximately 12 per cent and 17 per cent of the average salary, respectively.

During the second year of research, possible alternatives to existing water sources close to productive areas were studied in greater depth in cooperation with the area's producers. Identification of these alternatives focused on the possibility of recycling water. The results are provided below:

1. The Panamerica Complex's Olympic pools, located approximately 500m south of El Paraíso's productive areas.

In this case an analysis was performed to determine the possibilities of using the water drained from these pools. It was observed that even if the water met all of the conditions for use in irrigation, the facilities were built with an internal recycling system in order to reduce water costs. However, they must be completely drained once or twice a year. The water is drained through a conduit that passes close to the El Paraíso areas. This conduit belongs to a system fitted out for this purpose, as well as collecting other volumes of water yet to be determined. This possibility undoubtedly exists, but is contingent on the following four actions:

- a) Assessing the quality of water flowing through the conduit.
- b) Building a conduit to the production areas.
- c) Building a storage system.
- d) Installing a pump system.

As can be seen, this solution demands an investment of capital that the producers do not have, and therefore external support is required.

2. The possibility of using rainwater collected at every building in the Camilo Cienfuegos residential area (all buildings have three, four or

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twelve floors). This is collected by a rainwater drainage system of conduits emptying into the sea.

The use of this water for irrigation requires an even greater investment than the pools option, but it has not been discounted. As with the first alternative, constructing a system for using it will depend mostly on the level of permanency reached for agricultural activity in the area. The latter is directly related to its integration into the municipality's urban development project.

3. A third alternative identified was the Luis Soto Alba General Hospital, relatively near to the productive areas to the west (Intensive-Cultivation Garden, dispersed farmers adjacent to El Paraíso). While this facility generates significant volumes of residual waters, governing institutions do not authorize its use for irrigation. In this case the potential form of catchment was not assessed.
4. Lastly, it was reaffirmed that there is still the possibility of building wells, mainly in the belt furthest from the coast where water with a lower level of salinity could be found. In this case the amount of investment would be less, but it would be difficult to guarantee the volumes of water required.

On the other hand, producers do not discount building some sort of rainwater storage system that would contribute to irrigation for individuals or small groups, although significant volumes of water could not be obtained in this way either.

All of this analysis indicates that it is necessary to continue working in two important directions:

1. Integrating urban agriculture into the area's urban development project, which would lend permanence to the activity and facilitate the search for capital and construction of a more sustainable solution for irrigation water.
2. Producing a design of the potential agricultural zone for the area, consisting of 26 ha and conceived as a park or urban green space for food which includes the best and most comprehensive selection of crops and the availability of water for irrigation as an important aspect, among others.

Recycling Organic Matter

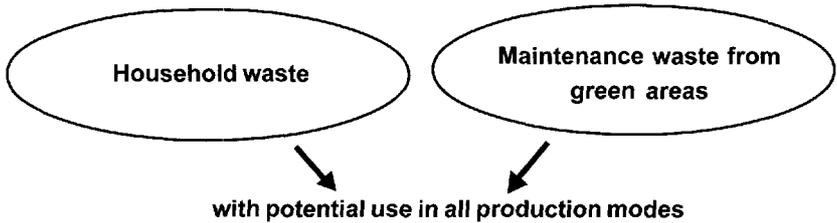
As mentioned previously, one of the principal weaknesses of urban agriculture in the city of Havana is the identification of sources and uses

of existing organic matter. The behaviour of the Camilo Cienfuegos area under study has been similar to the rest of the city.

It can be asserted that among the forms of urban agriculture present in Camilo Cienfuegos, the use of organic matter to improve soils has been limited to handling the remnants of harvests and trees and shrubs in each area. Only one of the El Paraíso Farmers' Group plots, the one bearing the same name, was recently established as an Organic Matter Production Centre with a view to marketing. To produce this fertilizer, manure from various dairies, somewhat far from the production area, is transported to the Centre. This not only impacts negatively on the ecosystem from which it is extracted but also incurs transportation costs, making it more of a problem than a benefit. The producer states that the supply of manure is not stable, and that it sometimes contains grass, soil and other materials that make the work more difficult. In addition, he does not have enough space to produce all of the organic matter the area requires.

On the other hand, the area's producers have worked on identifying possible sources of organic matter and its use. The identification of sources has been reaffirmed during the research process and is observed in the following results:

Possible sources of organic matter in in Camilo Cienfuegos



The possibility of using organic residues produced by kitchens and cafeterias of facilities such as the Luis Soto Alba Hospital, Panamerican Olympic Complex and farmers' market was evaluated. Because of the volumes generated, these are always collected and recycled by companies from outside the area who use them for animal feed.

Of the area's producers, the most significant effort to use part of potential organic residues has been made by the producers at the El Pedregal Intensive-Cultivation Garden. They worked with those responsible for collecting the remnants of pruning and green space maintenance to leave this material at the garden and began to prepare an organic compost. The volume of biomass that the Camilo Cienfuegos residential area generates through green space maintenance is estimated at 180 mt per year.

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Apart from the population's lack of knowledge regarding the benefits of recycling organic matter, it became evident that producers did not handle it properly. Some residents began to complain, fearing that a source of vectors would be created by the accumulation of non-organic materials (rubber, metal, etc.) and the occasional delay in preparing compost heaps. As a result, the Popular Council chairperson decided to halt the activity.

With this information the Research Team, which has included the manager of the El Pedregal Intensive-Cultivation Garden since its inception, decided to take progressive action that would revisit the situation and demonstrate the benefits of recycling organic matter for both residents and the garden.

The strategy was aimed at implementing small-scale actions with residents and training producers. In this way, results would be obtained that would give confidence to residents and motivate them to gradually join actions, thereby increasing organic matter for fertilizer production. The strategy also aimed to make residents recognize the need to use other sources of organic matter, such as residues from green space maintenance.

The following steps were taken:

1. In cooperation with the Popular Council chairperson, the problems arising from this situation and the benefits of revisiting it were evaluated, mainly from the perspective of appropriate management of organic matter. Producers were committed to this issue.
2. Identifying, together with the Popular Council chairperson, the producers and members of the Research Team, the best way to initiate actions with residents.

This resulted in identifying a residential building as close as possible to the Intensive-Cultivation Garden and conducting a motivation workshop with residents on the advantages of selecting and recycling organic matter, encouraging them to select and establish organic matter collection for the Intensive-Cultivation Garden's producers. The frequency of collection would be determined afterwards, depending on needs.

Residents would have the opportunity to visit the organic compost preparation site and observe its management, which would be one way of spreading news of the project through direct communication with other Camilo Cienfuegos residents.

3. The most appropriate building was identified, located 100 m from the Intensive-Cultivation Garden. It consists of eight apartments with a

total of 23 residents distributed among families of two to eight people. Cooperation with representatives from the neighbourhood association was established to motivate them in the task. They organized a workshop with the other residents and Intensive-Cultivation Garden producers.



*Organic Matter Collection and
Compost Preparation*



4. The workshop was conducted with the participation of 87 per cent of the residents and the proposal was well received. The residents of seven of the eight apartments became involved in the activity and asked about the possibility of using grass from green space maintenance.

The project is currently in the implementation phase and the Research Team keeps apprised of its progress through the Intensive-Cultivation Garden's manager and other team members. However, it is still too early to measure either quantitative or qualitative results. Monitoring the project will allow all cost benefits to be evaluated, as well as their impact on:

- Collection of domestic garbage.
- New producer-consumer relationships.
- New relationships among residents.
- Participation of family members.
- Initiatives and modifications developed by residents.

This project is an important advance that can be reproduced in other areas of the city. Small-scale recycling can expand until it has a significant impact on the urban environment.

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It is important to indicate that the project was not as well received among the El Paraíso Farmers' Group as at the Intensive-Cultivation Garden. This is due, in part, to the research project's membership. As mentioned above, the manager of the Intensive-Cultivation Garden has been part of the research team since its inception and the experience he acquired during the project's implementation has had a direct influence on the workers.

In the analysis carried out with El Paraíso producers, they stated that they already had all the training they needed to prepare organic composts, but 'it was one thing to know how to do it and another to actually do it', and that preparing composts from domestic residues involved work for which they were still not trained. However, the buildings are further from the El Paraíso plots than from the Intensive-Cultivation Garden.

On assessing this pattern, the Research Team considered it appropriate to avoid insisting and waiting for the results of the Intensive-Cultivation Garden project to create a level of motivation at El Paraíso. The farmers' lands are definitely losing productive capacity because they still do not completely use organic techniques and climatic conditions also affect the area. They therefore need to utilize all forms of producing fertilizer.

Marketing in the Camilo Cienfuegos Popular Council Zone

Within the Camilo Cienfuegos Popular Council Zone there are three ways to market agricultural products:



Price-Controlled Outlets

As in the rest of the country, the price-controlled outlets are part of a system of facilities where products that ensure a level of equality for all inhabitants are sold at prices and in quantities controlled by the state. This 'controlled' distribution, as it had been termed, has played an important role in meeting the population's food needs until the beginning of the 1990s, when the economic crisis began.

Currently, the government is making significant efforts to maintain equitable and subsidized distribution, but distribution levels are not the same as they were before the 1990s. That is why the population needs to turn to other forms of marketing, such as farmers' markets and urban agriculture.

Farmers' Markets

In the Camilo Cienfuegos Popular Council Zone there is only one farmers' market, located in the north of the neighbourhood in a section very near to the coast. This location makes access difficult for a large part of the area's consumers. A significant number of people who visit it do so as a secondary activity, after having gone to the bakery or manufactured gas outlets nearby.

Interviews conducted with market workers, consumers, urban agriculture producers and other key people demonstrate the following:

- Camilo Cienfuegos is a residential community with very few workplaces. Most working people commute to other parts of the city. These people generally shop in the areas where they work and only go to the market to buy something they need immediately and/or on weekends to make more important purchases.
- They estimated that during the vacation period (July–August) users and sales would increase. However, that did not happen because people also travel to other places during their vacation.
- Producers, or their representatives (it is organized so that no other intermediaries exist), are not encouraged to sell in this market because the demand is lower than the supply and they do not sell even 50 per cent of the products they bring. On the other hand, the market's administration charges each producer or his or her representative the corresponding taxes and rents. (See chapter on marketing.)
- Those in charge of the market were asked whether they had considered lowering the 10 per cent vendors are charged to encourage their presence to increase in numbers. They answered that they could go as low as 8 per cent, but it was a problem for them because the market is self-financing and with lower revenues they would barely manage to cover workers' salaries and other costs, such as the tax they must pay to the National Tax Administration Office (ONAT).
- The market's revenues and sale of products at better prices on Fridays have increased for some time now. This is because on Fridays a truck

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arrives with agricultural products from the province of Ciego de Avila, specifically Chambas, in the country's eastern region.

On the day the truck arrives there are more shoppers, which is interesting as it demonstrates that the problem is not only that Camilo Cienfuegos is a residential community, but also that the market's prices are high in relation to consumers' purchasing power.

The average number of vendors in the farmers' market is seven. Some 20 per cent of them are farmers from El Paraíso who visit sporadically and the rest are representatives of the three Credit and Services Cooperatives (CCSs) located in Güines and Aguilar (province of Havana) and Guanabacoa (City of Havana).

In the price pattern of products it is observed that prices are the same for all products, regardless of where the vendors come from. This pattern is similar in all of Havana's farmers' markets. Evidently, there is an agreement between vendors to set these prices.

The range of products offered varied according to the season. From May to October, grains, fruits, roots and tubers predominate, while between November and April the amount of fruits drops and there are considerably more vegetables.

Farmers generally offer a maximum of three products (fruits and vegetables), while cooperatives always come to the market with at least three different products and as many as six, above all during winter, the peak harvest season for vegetables and plants. The number of products per producer does not mean that the products differ between them.

On considering the total number of different products offered at the same time in this market, it was determined that the average varied between 11 and 17 for the periods mentioned. This variety of crops is the same as that of the city's most poorly stocked markets.

The sale of meat products merits separate mention. In the market (despite being the only place in the Popular Council where meat is sold 'uncontrolled'), it is limited to pork from the cooperatives for most of the year. At certain times, other types of meat are sold, such as sheep, but without predictable frequency. Currently the price of 0.5 kg of pork is approximately 12 per cent of the average salary.

On the other hand, in the Alamar neighbourhood in the centre of the municipality of East Havana and located approximately 10 km from Camilo Cienfuegos, mini agricultural fairs are held once a week, and on the last Sunday of every month a large fair is held in which producers from various parts of the country participate. Prices are lower at both fairs than at the

farmers' market and any other existing sales outlets. Residents of Camilo Cienfuegos attend these fairs, which also lowers the number of shoppers at the farmers' market.

The research team studied the average number of consumers entering the market, based on information obtained during three Saturdays in alternate weeks between 10:00 a.m. and 1:00 p.m. This is the busiest time and day at the farmers' market, according to the administrator and two of the oldest vendors at the market, who declared they had done 'studies' on the matter. The pattern is as follows:

Age groups	Men	Women	Total
Youths	—	1	1
Adults	15	31	46
Older adults	8	21	29
TOTAL	23	53	76

Note: Youths: 16 to 25 years. Adults: 26 to 59 years. Older adults: over 60 years.

The results confirm that attendance at the market is poor and only 63 per cent of those who enter make purchases (48 people). Some 81 per cent of those who bought something stated that the high price of products determined their decision. Women constituted 69 per cent of people who entered the market, showing that they are the ones who have greater responsibility for deciding what the family eats and shopping for food. The latter is similar to the situation in the rest of the city.

It is also noted that few youths buy these products and that working-age adults predominate (60.5 per cent). This may be explained by the predominance of extended families in Havana, where adults, particularly women, are responsible for these activities.

It is interesting that older adults making purchases are not the majority, although they spend most of their time in the area. This can be explained by the fact that the studies were conducted on Saturdays, when most of the week's shopping is done and better physical condition is required to carry the purchases given the market's distance.

Urban Agriculture

The study on the marketing of forms of urban agriculture in the Camilo Cienfuegos area showed the following pattern.

El Pedregal Intensive-Cultivation Garden

The Intensive-Cultivation Garden includes a sales outlet on the premises where marketing is done. The garden is currently arranging the

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commercial license authorizing it to sell, according to the established procedure.

Marketing at El Pedregal began with the vegetables with the highest demand among residents: lettuce, Swiss chard, cabbage and salad tomatoes. Supply of these products has been increasing, owing to the interest of both the population and the garden's workers. The latter is related to lesser-known products that provide quality and variety to the diet. Two examples are arugula and spinach.

El Pedregal offers, on average, five to 12 products daily, mainly leafy vegetables, herbs and flowers, depending on the season. During winter months it may market as many as 15 products daily. Some 80 per cent of the products marketed are grown in the garden and the rest are purchased from the Greater Havana Fresh Vegetable Company.

The Greater Havana Fresh Vegetable Company (EHM), through the Municipal Urban Farm, sells products such as sweet potato, tomato paste, yucca, black beans, garlic, plantains and others that are not generally grown in the garden to the Basic Unit of Cooperative Production (UBPC). The EHM buys these products from the CCSs, UBPC, field workers and other producers from the city or other provinces. This activity generates income for the EHM and, to a lesser extent, the Intensive-Cultivation Garden, as the profit margin is lower than when it markets its own products.

The EHM charges the Intensive-Cultivation Garden an additional 5 per cent on the cost of the products it sells for purchasing transactions and transportation. In addition, the EHM charges El Pedregal 5 per cent of its total sales revenue. The EHM allocates this 5 per cent as follows: 1 per cent to the Municipal Urban Farm and the remaining 4 per cent to the municipal tax office as a sales tax. As can be seen, the Intensive-Cultivation Garden pays the sales tax through the EHM.

The producers state that because of the EHM's prices, the low revenue earned from the sale of these products and the taxes they must pay, they would prefer that the EHM not sell them anything. However, they perform these buying and selling transactions for the social benefit it represents.

Yet, although the producers do not say so, selling products from the EHM increases the variety of supply, which attracts consumers even though it does not mean significant direct earnings for the Intensive-Cultivation Garden. In addition, the products from the EHM have a longer shelf life than those produced by the garden, meaning lower risk of losses.

This activity certainly increases the variety of products offered by the Intensive-Cultivation Garden. It has been proven that, on analyzing the daily sales records, the number of buyers increases 10–30 per cent and daily sales totals increase 7–25 per cent when these products are offered.

With regard to price setting, it must be said that before 1998 price records were not kept, although it is known that they were higher than they are now, mainly because of the excess currency in circulation during those years. Since 1998, prices of agricultural products have remained fairly stable, depending on the season.

Currently, the Intensive-Cultivation Garden's selling prices, as mentioned above, must be lower than the farmers' market and are set according to 'experience and taking into account the farmers' market's prices'. This way of setting prices means, in practice, that the Intensive-Cultivation Garden's selling prices, and those of other forms of urban agriculture, are defined by the farmers' market. There are many conditional factors that influence how much lower the price of a given product will be.

At this time the Intensive-Cultivation Garden's producers know what they spend on production and that labour represents 12–20 per cent of their costs if advances, incentives and social security are taken into account. However, as no fixed salary exists and incentives depend on the amount of products sold, it is more difficult to establish production costs.

Nevertheless, and aside from being unable to establish real production costs (for example, they do not take into account the cost of water for irrigation), they do not use this information to set prices and they recognize that this is a weakness.

In general, there is greater supply at the Intensive-Cultivation Garden in quantity and variety of leafy vegetables and fresh herbs than at the farmers' market. This results in the prices of some products being set by the Intensive-Cultivation Garden while prices for products in greater demand, such as cabbage, lettuce, tomatoes, etc., vary markedly during the winter season, depending on the farmers' market's supply.

The allocation of the Intensive-Cultivation Garden's production is as follows:

Allocation	Percentage
Marketing	90
Producers' own consumption	3
Social benefit	7

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It should be noted that the 7 per cent of production allocated for social benefit free of charge is distributed to:

- A cafeteria in the workplace nearby for the benefit of all of the garden's workers and producers.
- The cafeterias in the two Technological Institutes located in the area as a contribution to young people's education.
- The Government Housing Board workers' cafeteria.
- The Food Processing Centre that supplies the population (mainly herbs).
- A local boy recovering from heart surgery.

El Paraíso Farmers' Group

Until 1998, the farmers of El Paraíso could sell directly from their plots, but if they did it was in very small quantities and only during peak harvest periods. This is because the principal use of production has always been, from the first years to today, the family's own consumption.

Assessment of the producer's behaviour showed that:

- Most have a personal interest in using production for family, neighbours, friends and charity, as well as barter between producers.
- They like producing and dislike being involved in marketing. They do not like others to visit their plots because they see when they are planted, which may have an influence on theft.
- They believe that it is difficult for potential buyers to have access to their plots due to their location.
- It has happened that when, in times of harvest and excess production, a farmer wanted to bring his or her product to consumers, there were legal limitations (fines). They also observed that the product was bought at a low price and resold at a higher one to illegal middlemen, which they opposed.

Current marketing behaviour is as follows:

- Sporadically, one farmer or another markets in his or her area if a prospective buyer arrives, generally acquaintances and people looking for specific products.
- Two of the 53 farmers sell in the Camilo Cienfuegos farmers' market. They do not sell daily, but rather two or three times a week because the plot does not produce enough for more than that. They also market products for others.

- The Farmers' Group is arranging a commercial licence to establish a collective sales outlet near the Camilo Cienfuegos shopping centre.
- They have assessed the possibility of establishing a collective stand in the farmers' market, but decided against it because most producers there are large scale producers (UBPC, field worker CCSs) selling at higher prices who would try to pressure them on the issue.

Dispersed Farmers

There is no precise information regarding the level of marketing they may have, but it is estimated that it must be minimal, sporadic and carried out on the same plot, although access to them is more complicated than those in El Paraíso. They do not have a sales outlet.

Consumers' Relationship with Existing Marketing Locations for Agricultural Products in the Area

As mentioned above, there are three marketing locations for agricultural products in Camilo Cienfuegos, subject to market mechanisms: El Pedregal (Intensive-Cultivation Garden), the El Paraíso plots and the farmers' market.

In order to discover the relationship between consumers and the above sales outlets, as well as other aspects derived from this relationship, interviews were scheduled with 300 persons during two days over three weeks. Of the persons interviewed, 285 answered reliably (173 of whom were women, representing 60.7 per cent of the total). The following results were obtained:

People interviewed:

Men	Women	Total	Awareness level of	
			Two sales outlets (%)	Three sales outlets (%)
138	147	285	100	18

It is evident that most interviewees were not aware that there were three sales outlets for agricultural products. In all cases the place they did not know was that of the El Paraíso farmers. On the other hand, 61 per cent of those that knew it stated that they do not go there to shop because of the distance of the plots and the difficulty in travelling to them.

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People who...	Total	Percentage
Shop outside of Camilo Cienfuegos	165	58
Only shop at the farmers' market	43	15
Shop at the Intensive-Cultivation Garden	196	69
Shop at the El Paraíso club	20	7

Note: Percentages refer to the total number of interviewees.

Of all the interviewees, 58 per cent stated that they make use of their time outside of Camilo Cienfuegos (for work or other reasons) to buy agricultural products or they go to other parts of the city specifically for this reason, which does not mean that they do not occasionally go shopping at any of the other sales outlets.

Despite the prices, no one shops exclusively at El Pedregal or El Paraíso, possibly because products in high demand such as rice or meat are not sold in these places. This means that for the moment competition is not exclusive and complementarity becomes necessary.

Some 89 per cent (253) of the people interviewed stated that the products at the farmers' market were more expensive or the same price as those sold in other parts of the city. This is one of the reasons why people also go to the El Pedregal Intensive-Cultivation Garden. However, a similar number recognized that the supply and variety of the farmers' market were better than those of the Intensive-Cultivation Garden or the El Paraíso farmers.

Some 45 per cent of interviewees (145 people), mainly those living to the south and west of the Camilo Cienfuegos shopping centre, stated that they preferred to go to the Intensive-Cultivation Garden because, apart from the lower prices, the farmers' market was too far away for them. This confirms the observations about its location. Currently there is an attempt to move the farmers' market to a central location in the neighbourhood.

When products such as potatoes, plantains, citrus fruit and others arrive at the price-controlled outlets, sales of similar products drop to some extent in the area's other sales outlets. The term 'similar products' is used because, for example, potatoes are the only product that is exclusively price-controlled and therefore not for sale in the other commercial spaces. However, they are substituted by products such as sweet potatoes, yuccas and, to a lesser extent, yams, taros and occasionally plantains.

Evidently, in Camilo Cienfuegos there is still great potential for expanding marketing through the farmer's market and forms of urban

agriculture. Supply is still less than the demand, as demonstrated by the amount of people who leave the area to shop in other places.

On the other hand, apart from competition, a complementarity process could take place regarding the variety of products offered in one or another sales outlet, which would undoubtedly enrich the activity in the area and contribute to improving the quality of life as far as increasing the availability of food and reducing the need to look for it elsewhere. For example, almost 35 per cent of interviewees indicated that they would prefer to buy fruits and vegetables at El Pedregal and starchy root crops and grains at the farmers' market, even when both items are sold at the same place.

Impact of Agricultural Activity on Producers' Families

This topic has been approached from different perspectives, with the objective of demonstrating the benefits obtainable from urban agriculture for the families that are involved in it. To obtain information, it was decided that it would be more worthwhile to avoid limiting ourselves to simply interviewing family groups or producers and involve members of the research team, producers and their families in a participatory analytical process. This was aimed at gathering evidence on results observed in relation to family income, time spent on agricultural activity, the ways in which family members participate and the contributions to the family food hamper. The results obtained are summarized below.

The average salary in the city of Havana is 217.00 Cuban pesos per month (for 1997), whereas, on average, each worker at El Pedregal Intensive-Cultivation Garden earns three to four times that figure in the same period. This same worker also is able to enjoy, free of charge, up to 30.00 Cuban pesos' worth of produce each month from the Intensive-Cultivation Garden (15.00 Cuban pesos' worth each two-week pay period), which raises the family's relative income even more, thanks to this saving.

It must be pointed out that the money that each garden worker receives monthly is not considered a salary but rather an 'advance'. The amount of this 'advance' is 200.00 Cuban pesos per month for workers and 250.00 per month for shift managers and first and second assistant managers.

It is evident that the difference between workers and managers is not very significant. On the basis of this advance, a system of incentives was jointly established by UBPC workers. The incentives are in operation at harvest time, that is, for six months a year, and they work in the following way:

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- Each worker obtains 2 per cent of the total profit from monthly sales.
- The most productive worker of the month (the one who has the best results) obtains 3 per cent instead of 2 per cent.

Although the income of El Paraíso Farmers' Group members has not been quantified, it is possible to affirm that their income is generated at the time products are marketed. The main benefit in this case is from the savings made by not having to buy products that can be harvested from their own plots.

Each farmer's family has four or five members, which means that more than 230 people directly consume produce from the plots.

In consultations with sixteen women from these families (wives and daughters of farmers), it was estimated that some 60 per cent of them help tend the plots.

They say that their assistance is not systematic and does not involve a significant amount of time, given that they are responsible for domestic chores and they also work outside the home. With regard to employment, it should be emphasized that, in Cuba, men generally retire at 60 years of age, whereas military men can retire at a younger age (45), and that women can retire at 55. Because of this, many farmers' wives still work outside the home.

A similar situation exists for other members of the farmer's family, male and female, because those of an age to attend school or go to work generally do so, and little time is left for helping out with activities at the plots.

Nonetheless, the wives and daughters that were consulted expressed the opinion that farmers' work was very important because of the benefits it brings in feeding the family, improving nutritional habits and saving money that can then be spent on other necessities. They said that they directly influence what is harvested from the plot by requesting that their husbands or fathers plant certain crops needed in the home.

They also explained that, in the beginning when the plots were just being established, there was a lot of work to do in clearing, removing rocks, planting trees and other tasks. At that time, they contributed their support and hard work but, now that the work is mostly maintenance, they participate less.

There is still a problem in identifying exactly how much of the family food hamper comes from the farmer's plot or the portion of produce that Intensive-Cultivation Garden producers are allowed to take home at no

cost. As explained earlier, the figures for urban agriculture, with few exceptions, are generally estimates.

However, producers assure us that hardly a day goes by without one or more products from the plot or garden being consumed in one or more meals at the family table. Regular items at meal time, depending on where production is carried out, include fresh vegetables, yucca, plantain, fruit juice and fruit preserves, fresh fruit, cooking herbs and spices, to name a few. They estimate that approximately 30 per cent of the family food hamper is provided by the plots.

Nevertheless, it can be estimated that about 90 per cent of fruit preserves consumed in the homes of these urban farmers is made from the products harvested from the plots, because this is a way to take advantage of the surplus at harvest time. However, these products are not marketed because 'it is not allowed', but it is customary to give them to friends and neighbours as gifts.

These same families inform us that they consume plot-produced yucca and plantain harvested for New Year's and on other special occasions, although sales for this produce are generally highest at those times of the year, because "you have to take care of your own home first."

Perspectives on the Maintenance and Development of Urban Agriculture in the Area Studied

Although throughout this chapter we have been pointing out some of the elements that show potential and weaknesses regarding the maintenance and development of urban agriculture in the area, there are other elements that also have a greater or lesser influence, directly or indirectly. The following is a summary of the most important ones that have arisen from this research.

Intensive-Cultivation Garden

El Pedregal producers inform us that being a member of an association (Basic Unit of Cooperative Production) brings with it benefits of self-financing operations, internal and external controls, and a certain degree of independence. Workers there are covered by social security and accumulate time and funds for retirement pensions. They are also guaranteed a percentage of their salary even when they are sick. These advantages are incentives to remain at this activity.

Moreover, producers say that working at an intensive-cultivation garden means:

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- Professional development.
- The satisfaction of producing substantial amounts of food to meet the needs of the population.
- Public recognition of the social impact represented by offering food for sale at more accessible prices.
- Knowledge of the ecological benefit they are providing, because the area that they are now using for crops used to be a garbage dump with serious sanitation problems.
- The satisfaction that, although they work very hard, they see the results (high salaries).

It is important to point out one element that will affect the possibilities of keeping the Intensive-Cultivation Garden in the area. There is a positive relationship between producers and residents as well as between producers and other entities with whom mutually beneficial links have been developed.

It is also true that there are disadvantages in that the Greater Havana Fresh-Vegetable Company (EHM) requires them to go through a lot of red tape and paperwork (statistics, financial controls, among other tasks), which takes time away from agricultural work. They have to keep books showing the arrival and departure times of workers, maintain payrolls and carry out other administrative tasks as if they had a Department of Labour and Salary Organization, the same as any other government agency.

The EHM, through the Urban Municipal Farm (GUM), sets out an annual production quota for which it demands compliance, but without any agreement with UBPC workers. However, only repeated failure to comply with this quota could lead to a decision to disband the UBPC. The GUM requires these controls but provides very little in the way of materials to facilitate production.

The GUM only supplies them with seed for crops that the Company wants the UBPC to produce. This (supposedly certified) seed provided by the Seed Supply Company through the EHM sometimes has very little germinating power. It is only after this irregularity is repeated under various modes of production that the UBPC has any possibility of being reimbursed for it. On the contrary, the EHM takes it for granted that the problem arises from poor handling by producers. When the UBPC wishes to establish a crop that is not an EHM priority, it has no way of acquiring the seed. The EHM used to facilitate the acquisition of chemical fertilizers, but it no longer does so.

All of these problems tend to adversely affect producer motivation and they are issues that must be addressed in order to simplify the work of these men and women and help them build a greater personal identification with their work. As it stands, they tend to limit themselves when it comes time to possibly launch a new activity, such as raising livestock, because they know beforehand that their lives will be complicated by bureaucratic paperwork and applications for authorization.

Farmers' Group

Interviews conducted with farmers show that they have the desire and the intention to continue producing in their respective areas for as long as possible. This assertion, in practice, is related to the following:

- The majority of the 53 farmers who began farming at El Paraíso ten years ago are still organized and still producing.
- They have put a lot of effort into planting fruit and timber trees, which is proof of their interest in remaining in crop production in the area.
- The intensive labour involved in preparing the land for cultivation (removing rocks).
- They are going through procedures to obtain a commercial licence to set up a sales outlet that would identify who they are and enable them to legally carry out this activity.

The people interviewed stated that the main reason they might stop raising crops in this area would be if the government requested the land for housing construction, depending on what the plans may be. However, they believe that urban development projects must take into account the possibility of keeping crop production areas.

It is important to underline that two of the farmers interviewed stated that one possible reason for quitting crop production is if the food needs of the population were ensured by the market (as in the past). At this point, an argument broke out among them, based on the fact that Cuba has always depended on food imports to satisfy its needs and that agricultural production in the cities is a very important way to educate future generations.

The farmers stated that belonging to a group gives them permanency in the area, along with the following advantages:

- They receive consultative services and training.

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- They receive encouragement from the institutions and persons that they deal with.
- They receive information from the People's Council, the Urban Municipal Farm and other institutions, such as, for example, the new regulations on plant health, news on upcoming community activities, etc.
- They share different varieties of seeds, seedlings, organic fertilizer and other items with each other.
- As a group, they are currently allowed to operate under a commercial licence.
- It is a way to establish and maintain friendships.

In addition, services from the GUM are steadily improving and there are free orientation sessions from the Department of Plant Health under the Municipal Group of Urban Agriculture when pests and diseases infest the crops. In addition, farm implements, seeds, biopreparations and other items are made available for sale by the GUM in Agricultural Support Stores.

Even though the El Paraíso Farmers' Group is not subordinate to any institution, its members have direct relations with the representative from the Urban Municipal Farm, where they file monthly production reports, and with the chairperson and other members of the People's Council. They also receive a large number of national and foreign visitors to whom they show the results of their labour.

General Considerations

When it comes to the development of a local economy, it can be asserted that the Camilo Cienfuegos zone has shown similar performance to the rest of the country, as mentioned in the introduction. This is even more striking if we bear in mind that practically no state productive or service facilities of any significance have been created there during the last few years and that the presence of freelance or independent workers, quite prevalent a short time ago, has diminished to the point of almost disappearing. Examples of this phenomenon are the small family restaurants known as 'paladares' in Cuba.

Notwithstanding the above, urban agricultural activity can be regarded as a modest component of local economic activity, owing to its production and marketing as well as its acceptance among the population and the benefits it brings to local residents, whether producers or consumers.

This potential must be addressed and developed on a larger scale. The following is a general summary of the most outstanding elements and those that require improvement:

- Agricultural activity in the area has been evolving and consolidating. This is demonstrated by the permanency of producers over time, the increase in output and the agencies and institutions involved in the activity. However, other possible forms of production have not caught on and production on plots and Intensive-Cultivation Gardens still exclusively predominate. The former shows a marked tendency toward family consumption and the latter is clearly oriented toward marketing.
- The organization of farmers means better access to training which, in turn, is reflected in more productive results, all of which contributes to the activity's sustainability. However, it is evident that others in the area are interested in urban agriculture (dispersed or independent farmers) and no action has been taken that would meet these people's requirements and help them to reach their productive potential.
- Water treatment for irrigation and availability of organic matter, issues basic to the activity's sustainability, are not being given the attention they require, and this is largely due to producers' confidence in continued state subsidies for their labour.
- There are serious natural limitations to agricultural production in the area, which helps to explain the low percentage of land used for agriculture compared to estimated potential. This, in turn, is reflected in the need for technological training regarding concrete natural conditions, and these aspects are still not covered by the organizations responsible for them in the area.
- Interviews have shown that gender relations in the agricultural sphere are based on the predominance of men in productive activity as such, in which women participate by providing support at specific times as a means of encouraging certain kinds of production. Nonetheless, it is women who inculcate food habits by being in charge of distributing money for purchasing food and defining which food products are most needed in the home. Moreover, women prepare food and possess the culinary knowledge and food preservation skills that could be used more amply with the help of training and other direct actions aimed at women.

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- Current forms of marketing do not meet the demand of people residing in People's Council zone, either because of poor location in relation to most of the population or the limited variety of products offered and the prices charged. To address this issue, all of the area's potential must be taken advantage of, in terms of both area and population.
- For the moment, producers do not seem to be concerned about the possibility of being displaced from the land they occupy, in spite of the concessionary nature by which the lands were allotted to them, because they are backed by the recognition of both municipal and national governments, which make possible the improvement and development they require.
- One very important aspect is the outstanding support received from local government. The People's Council, to the degree that it has become acquainted with the area's potential, is searching for other ways of boosting producer-consumer relations for the benefits that these relations may provide. One example is the action taken to target residential waste for purposes of producing organic fertilizer.
- This local government support also has a bearing on the possible incorporation of urban agriculture into legislation at higher jurisdictional levels. One means is by starting with its recognition by agencies involved in the management and control of the city such as, for example, the Provincial Physical Planning Branch. It is hoped that ways and means can be found to put this all together in practice by drafting a project for the area in which urban agriculture would be permanently integrated.



Notes

1. Construction brigade formed by labour collectives and residents for building and maintaining housing and charity work.
2. City of Havana Provincial Physical Planning Branch.
3. Centro de Investigaciones de la Economía Mundial. *Investigacion sobre desarrollo humano y equidad en Cuba 1999*. Havana, Caguayo, 2000.

Chapter VIII

INSERTING URBAN AGRICULTURE INTO THE LAND MANAGEMENT SYSTEM

This chapter proposes a new way of addressing the subject of agriculture within the land management system of Havana, using the experience gained over the last years in urban agriculture and the new insights emerging from this research.

This chapter provides a brief overview of the Physical Planning System in Cuba and the involvement of different agencies in the management and control of Havana, as well as their roles in the development of urban agriculture.

This new perspective considers the links of urban agriculture with other activities in the city, since any new intervention in the urban structure would require a new accommodation of the functions already existing in the city.

* Eneyde Ponce de León Triana helped with the drafting of this Chapter.

The Physical Planning System in Cuba

The origins of what we now call land management, with all its variants, adaptations and modes can be traced far back into Cuban history and it is linked to the need for organizing the space according to different functions and economic and social aims.

Cuban history shows very early references to city planning, but the main objective at that time was the defence of towns and villages as well as the location for certain activities. From the eighteenth century onwards, several Governing Plans and Urban Projects have been designed for specific purposes or to accommodate the requirements of the governing body of the moment, without much concern for the actual social and economic conditions of the cities and, of course, giving special preference to the capital city.

The origin of physical planning as an established institution in Cuba can be traced to 1960 when the Minister of Public Works issued a By-law on May 19 establishing the Physical Planning Secretariat as part of the Ministry of Public Works.

The newly formed group of planners, motivated by the revolutionary laws and with more enthusiasm than real knowledge began the essential task of designing and planning the transformation of the land base. The starting point was to consider the requirements of the social and economic order that was just being created and whose objectives were, among others, to redress the huge imbalances in the distribution of the land, to improve the living conditions of the general population, in both urban and rural areas, and to promote agricultural and industrial development.

Years later, the physical planning functions were established as a system covering all the national land base, with representatives in each of the provinces and structured as a regional operation concerned principally with land management and secondarily with the functional and territorial organization of the social and economic activities. This structure allowed for the coordination and harmonization of the physical planning activities at the national level with the sectoral plans and programs. The basic conditions for attaining the ever-present objective of creating organic links with economic planning were thus established.

Throughout this first phase and up until 1976, the national level, represented by the Physical Planning Institute (Instituto de Planificación Física) was linked to the Ministry of Construction. From 1976 onwards, the physical planning activities were institutionally divided by the Council of Ministers into two branches as follows:

1. National level: The Instituto de Planificación Física (IPF) became a part of the Central Planning Board (Junta Central de Planificación), currently the Ministry of Economy and Planning.
2. Provincial level: The Physical Planning Provincial Directorates became part of the People's Power governing bodies (local grassroots governmental organizations). This produced the following subdivisions:
 - a) Administratively, they report to the People's Power organizations. They constitute a level of the provincial government.
 - b) Methodologically, they are guided by the Physical Planning Institute.

At the beginning of 1978, the Executive Committee of the Council of Ministers adopted By-law No 21, 'Reglamento sobre la Planificación Física' (Rules and Regulations concerning Physical Planning), defining the contents, scope and work levels for physical planning.

On the other hand, physical planning activities in Cuba have consistently included new planning tools and have adapted their structure to fit the new realities of the national economy.

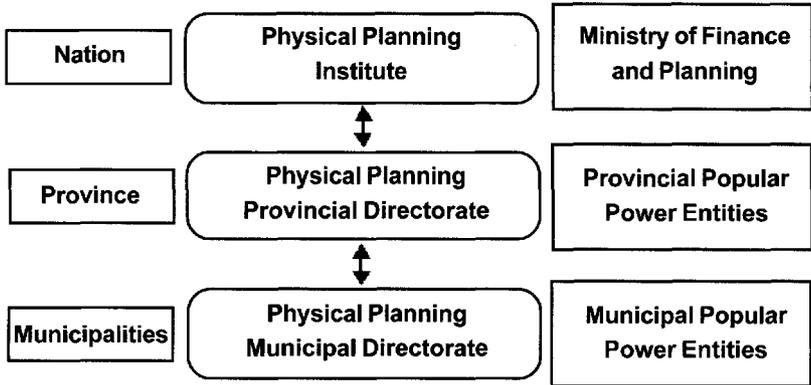
As a result, physical planning has played a key role in putting into effect the principles of social justice, equity and development that have characterized the transformation process experienced by our society. Its specific objectives have been the following:

- Efficient use of the soil as a non-renewable resource by properly locating productive and social activities and by using the soil to its full potential.
- Balanced economic development in the national territory (among regions, human settlements, rural areas and within the cities).
- Responsible management of natural resources, as well as the protection and reconditioning of the environment in order to attain an ecologically sustainable development.
- Preservation of the social use of the public soil, and the protection and reconditioning of the cultural heritage and related property.

Structure of the Physical Planning System

Physical Planning has been methodologically structured in such a way as to be connected at all levels with the general Cuban Planning and Administration System.

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Responsibilities at the National Level (Physical Planning Institute)

- Formulation of integrated land management proposals according to the Land Management National Plan and according to land base national policies 'by assessing the sectoral plans in relation to the Human Settlement System, environmental factors and the desirable proportions of the national land base'.
- Adoption of the same approach at all the subordinate levels.
- Development of scientific and technical research programs in matters under its jurisdiction.
- Collaboration with other institutions concerning topics and programs of national interest.

Responsibilities at the Provincial Level (Physical Planning Provincial Directorate)

- Execution of the Land Management Plans according to the policies and strategies governing the planning of the land base through the formulation of principles, criteria or hypotheses. Activities are planned for the medium term.
- Development of the Land Base Plan according to a set of provisions regulating the use of the land and in line with the sectoral economic program. Activities are planned for a 3- to 5-year period.
- Formulation of Urban Regulations and monitoring compliance, according to the Land Base Management Program.
- Development of partial plans, special plans and urban projects.
- Investment location studies and urban feasibility studies.

Responsibilities at the Municipal Level (Physical Planning Municipal Directorates)

- With the promulgation of the Housing Act in 1984, the Architecture and Urban Planning Directorates were created with the special responsibility of controlling the use of the land. Within the context of the 'special period' and in the midst of a growing planning decentralization trend, these Municipal Directorates included in their routine tasks the execution of General Plans as part of the municipal planning, thereby becoming Physical Planning Municipal Directorates with significant participation at the local levels. They also assumed the responsibility for carrying out such additional planning tasks as the Special Plans and the Studies of Details.
- These Directorates report administratively to the municipal government and follow the general approach established by the Physical Planning Provincial Directorate.

Land Management in Havana

The history of changes and development in the Havana land base can be traced by looking at the several existing layouts and designs. During the revolutionary period (1959 to the present) five Governing Plans and Layouts have been made, refined and adjusted to suit the potentiality and restrictions of the land base and to reflect the new demands and requirements of the Cuban society and the city. These Governing Plans and Designs are made compatible with those of the other sectors (Water System, Public Health, Community Service, Environment Agency, and others), to ensure the participation of all stakeholders in the general interests of the city.

The Green Areas System is part of the land management plan of Havana. It is based on the inter-connection and continuity of the city spaces and guarantees their uses and functions according to location, and, at the same time, it integrates the different urban functions.

The Green Areas System extends from the outskirts of the city through bio-corridors up to the central region. The areas are well integrated within the urban design and they contribute greatly to the image and function of the city.

Two interventions that need to be carried out, however, are the following:

1. Activities involving large city parks with components such as common public parks, special parks, countryside parks and protected green

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areas, green areas for restricted use and woodlots, among others, with new elements already included, such as theme parks, technology parks, railroad parks, gardens or other historic areas, walking trails, etc.

2. Spaces blending with the scale of urban design: trees in beds, public, semi-public and private spaces, gardens, street-parks, etc.

The Plan known as the Havana Belt, initiated by the government in 1966, was a milestone that marked changes in the agricultural approach to be established in the immediate periphery of the city and had a great impact on the city and its people.

Apart from the negative environmental impacts that this plan could have had, it was important because it brought about massive participation by the people in Havana. This Plan involved the creation of a fruit-tree belt in lands near urban areas and, subsequently, a dairy belt. In fact, the Havana Belt can be considered the most important event marking the development of urban agriculture in Havana.

During those years, thousands of Cubans went daily, as volunteers, to cultivate seedlings, prepare the soil, sow and carry out many other associated tasks. For a while their culture as food consumers came to include habits of food producers. This was another sample of the Cuban model of community participation, whereby the people take on a government project and develop it as their own.

On the other hand, a study published in 1985 indicated the need to integrate the agricultural activities with the Green Areas System. Even as early as 1985, the problems of sectoral treatment given to agricultural peri-urban production and the need to integrate it were evident.

This study pointed out that:

the sectoral analysis used in evaluating current problems showed the need to integrate and to complement this study with the idea that the land base is only one, that the requirements are many and that, in order to satisfy those requirements, it is necessary to use the undeveloped lands in the province intensively and in a rational manner.

The Group in Charge of the Integral Development of Havana

In 1987 the Group for Integral Development of Havana (Grupo para el Desarrollo Integral de la Capital, GDIC) was created and a multidisciplinary team was formed and given the task of implementing new approaches for

the city. This group, in terms of content, did not replace the planning and monitoring activities of the Physical Planning Directorate at its different levels. Its main objectives were the following:

- Advising the government of the city on urban problems.
- Coordinating the strategic plan for the economic and social development of Havana.
- Carrying out studies and research projects on urban issues.
- Promoting urban culture through the Pabellón de la Maqueta de La Habana and develop activities on urban topics.
- Providing methodological guidance through the Neighbourhood Workshops, Talleres de Transformación Integral de Barrio (TTIB), created at the suggestion of the GDIC as part of the participatory planning at grassroots level. These workshops also carry out urban agricultural projects, among others.
- Promoting and managing different projects through international collaboration.

As the main institutions concerning land management matters in Havana, both the Physical Planning Directorate and the Group for Integral Development of Havana have been involved in one way or another with the development of Urban Agriculture in the city. The Physical Planning Directorate has been actively involved in compatibility and zoning issues connected with the different plans and interventions proposed. The role assumed by the Group for Integral Development of Havana has focused on promoting and managing community projects where a recurrent topic has been food security through TTIB and community gardens.

The Involvement of Physical Planning in the Development of Urban Agriculture During the 1990s

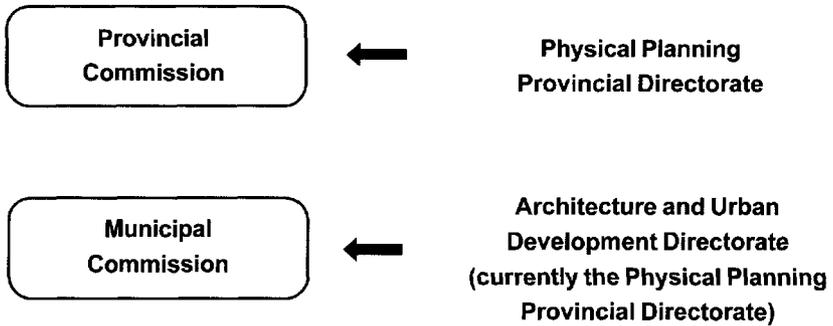
At the end of 1989, the government of Havana created a provincial working commission charged with developing urban agriculture. However, at that time it was not named as such. This commission had the following responsibilities, among others:

- To set out the main working lines for such development.
- To define the conditions to justify the agricultural use of urban spaces.
- To create mechanisms for transferring responsibilities to grassroots bodies (municipalities and people's councils) through a direct operational activity.

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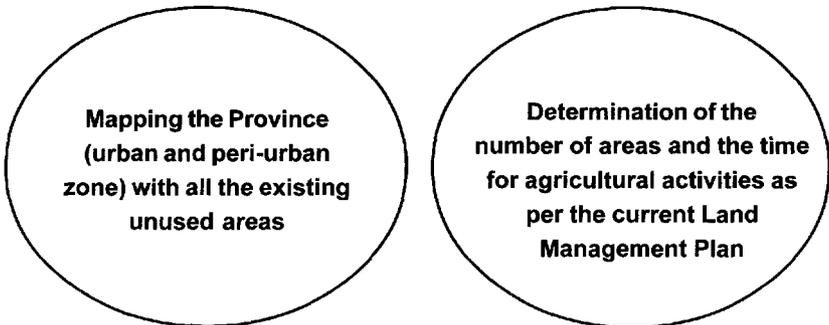
From the very beginning this provincial committee included the Office for the Cooperative and Farmers Sectors of the Ministry of Agriculture, the Physical Planning Directorates, Water Resources and Public Health, as well as representatives from such social organizations as the Committees for the Defence of the Revolution and the Federation of Cuban Women.

The Provincial Assembly of Popular Power reached an agreement whereby the Municipal Work Committees were created with a composition similar to that of the provincial committee. These work committees were in charge of promoting and developing urban agriculture at the municipal level; the Architecture and Urban Directorates were later included in these committees.



The creation of these committees at the three government levels (Provincial, Municipal and People's council) started to generate the institutional and social participation required as a basis for developing urban agriculture in Havana.

The first actions carried out by the Provincial Directorate of Physical Planning were:



In size, these free areas, mainly state-owned land, could be from 150m² up to more than 30 ha, depending on their location:

- Smaller plots were located in central municipalities, with a higher construction density. Medium-sized plots were usually located in residential neighbourhoods.
- The plots or lots between 0.5 ha and 2 ha in size (although it was possible to find larger ones), were located mainly in intermediate municipalities, within the city or as part of work centres, education centres and others.
- The larger areas were located mainly in the peri-urban zones and belonged to state-owned agricultural companies that were not using the land.

The study carried out by the Provincial Directorate of Physical Planning, together with the general conditions set down by the Committee in charge of handing over land in the above-mentioned areas, were submitted by the latter to all municipal Presidents of the Popular Power (mayors). Such conditions included the temporary nature of the use of these areas, in all cases; the obligation of using the space in a productive manner; the prohibition against building anything permanent (houses or other buildings); and the prohibition against cutting trees.

The Provincial Committee was directly in charge of handing over the largest lots to the work centres that applied for them and determining the locations of high-yield urban gardens, since these were a government investment. In this respect, it is important to note that the Physical Planning Directorate discussed a proposed location with several governing bodies, such as the Provincial Directorate of Water Resources, before granting its approval for any investment. This integration of the Committee was instrumental in speeding up the investment approval process in the specific case of the high-yield intensive-cultivation gardens.

The rest of the lots handed over, especially the small and medium-sized lots located in the city came under the responsibility of the municipalities (municipal committees) and People's Councils assisted by the Provincial Committee.

During these first years of the 1990s, the Committee for the Reforestation of the City (created in 1983) was strengthened by the integration of the institutions that were part of the provincial committees for the development of urban agriculture. This was a clear instance of the aim to guide urban agricultural activities beyond the production of food.

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Subsequently, new work areas were created at the provincial level, directly under the responsibility of the provincial committee. These new work areas were joined by the following institutions, according to their objectives:

- The Aquaculture Development Program of Havana, organized by the Provincial government and the Fisheries Ministry in 1994. Places for small reservoirs, dumps and small water containers for raising fresh-water fish were located, as well as areas for building water tanks.
- The location of community areas for collective pig-raising activities in 1994. Given the urban nature of the province, pig-raising activities were prohibited. The provincial committee, which was expanded with the inclusion of the Veterinarian Medicine Directorate, made a complete revision of the existing health and urban planning regulations.

These regulations stated that pig-raising was permitted only in areas at least 5 km distant from the last construction of an urban-development area and 1 km distance from any source of water supply. The former regulation was amended to 3 km from the last building, while the regulation concerning the distance from the water supply remained unchanged. These adjustments were instrumental in determining the areas in the province where small-scale pig-raising activities could be permitted.

The development reached by Urban Agriculture during the first four years of the 1990s, as well as the need to strengthen the state-owned agricultural sector of the province, necessitated the creation of a separate entity that would represent the Ministry of Agriculture (MINAGRI) for this purpose and a MINAGRI representative was appointed. From this structure, created in 1994, emerged the Group for Urban Agriculture Coordination, Promotion and Training. The municipalities adopted a similar structure.

The Ministry of Agriculture complemented this structure in 1995 with the Province Ciudad de la Habana Committee for agricultural extension, coordinated by the Research Institute for Tropical Agriculture (INIFAT) and included the various research institutes of the Ministry of Agriculture. The main objective was to provide support for the technical work of Urban Agriculture. This Committee was the forerunner of the National Group of Urban Agriculture.

The National Group of Urban Agriculture currently serves the whole country. It develops the technical extension activities, annual strategies and guidelines for obtaining high yields and for providing the population with different products. These guidelines have been grouped into

subprograms (fresh vegetables and cooking herbs, fruit trees, rice, and so on up to 26 categories).³

With the creation of this nation-wide group, urban agriculture has acquired the level of an institution, and until it was dissolved in 1996 the Provincial Commission provided support for the agricultural development activities in the city. From 1996 onwards, the role of the Physical Planning Office in the province was focused on investment management,⁴ as required by the local MINAGRI office, and on providing information support for inquiries concerning specific programs such as reforestation, also known as *My Green Program*.

As a result of all these processes, urban agriculture found its way into Havana's land management plans and other documents regarding the insertion of Urban Agriculture into the land management system.

Evidence of the foregoing is the approval by the city, in 1991–92, of the updating of the Land Management Plan until 2010 and of the First Strategy Development Plan developed by the Physical Planning Directorate and by the Capital City Integral Development Group. None of these governing documents included urban agriculture. However, in the last land management plan (approved for the city in December 2000) urban agriculture was included on a general scale and treated as an independent activity of a permanent nature for the peri-urban zone and as a temporary measure in the urban zone and in the newly developed areas.

Insertion of Urban Agriculture into Land Management

During the research process, the topic of inserting Urban Agriculture into the land management system was addressed directly and indirectly in the research application at the regional level and also in urban agriculture as an evolving activity in the city.

This process proved the need to develop a broader proposal taking Urban Agriculture to a higher level of institutionalization and defining its place within the city's management and control structures.

A workshop was carried out for this purpose with the following participants: the research team, Physical Planning Directorate representatives, the Capital City



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Integral Development Group, the Faculty of Geography, Habitat Cuba, the Urban Agriculture Directorate of the city, a producer of the Camilo Cienfuegos region, the Faculty of Architecture's Urban Studies Centre of the Instituto Superior Politécnico José Antonio Echevarría, and other experts.

Given the importance of the series of definitions that had to be established before arriving at the proposal for how urban agriculture could be inserted into the land management system, a summary is provided below:

1. Why insert urban agriculture into the land management system?

- Urban agriculture is a significant activity with a strong presence in the use of the land, as well as production and consumption activities in almost all the municipalities of Havana.
- Urban agriculture was created by the government and accepted enthusiastically by different sectors of the population.
- The economic and environmental results of urban agricultural activities in Cuba have been positive.
- It is important to continue with urban agricultural activities beyond the economic crisis, natural disasters or any other specific situations.
- Cities have new needs, and it is important to integrate urban agriculture as one of them.
- Urban agriculture should be placed at a higher institutionalization level: proper recognition of its functions and requirements for a legal framework.
- Urban agriculture should be developed, managed and designed from a land-management point of view.
- Urban agriculture should be linked with other urban components.
- Urban management activities should be linked with other related institutions.
- Urban agriculture activities should be controlled.
- The city will always have vacant spaces.
- Urban agriculture contributes to the achievement of other urban planning objectives (quality of life, value of urban soils).
- Urban agriculture should be addressed as a formal activity of the city.

- Urban agriculture would be better positioned for reaching its full potential in relation to the various urban sectors (space in urban projects, commercial relation with the tourism sector).

There are powerful and sufficient reasons in support of inserting urban agriculture into the land management system.

2. What would be the basis for stating that urban agriculture should or must be regarded as an urban function?

- Urban agriculture is behaving, in practice, similarly to other urban functions in the use of spaces and the actors involved.
- Urban agriculture is a productive activity that uses space in the city and generates output. It interrelates with other spaces and functions in the city (housing, people, markets), and that is why it should be regarded as a permanent urban function.
- Urban agriculture improves the quality of life by guaranteeing food security, enhancing the image of a city that is closer to nature, improving the health conditions of the urban environment, and including the most vulnerable sectors in Cuban society, such as elderly people.
- The resources required by urban agriculture have an important impact on the use of urban waste.
- Urban agriculture, as an urban function, can be developed with more objectivity, establishing criteria, policies and strategies for reaching a level of development in accordance with the main characteristics of the province.

Urban agriculture should be considered as a permanent function. The recognized use of the space in the medium and long terms would eliminate the possibility of considering urban agriculture a temporary activity.

3. As an urban function, where does the development and enhancement of urban agriculture begin?

- As a government activity, allowing the state to generate investments and to play the role of facilitator and of governing, monitoring and regulating body of urban agriculture activities through:

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- Local governments' contributions and resource channeling for developing urban agriculture.
- Local governments acting as coordinators of other government agencies, the private sector and non-governmental institutions.
- As an individual and/or collective activity, but always having an impact on the community, urban agriculture requires participatory planning for the following reasons:
 - The community is the main actor in urban agriculture.
 - Urban agriculture generates profits at the local level.
 - Urban agriculture promotes exchanges, self-sufficiency and local development.
 - Urban agriculture saves the government money and resources.
 - Urban agriculture is instrumental in helping the community to discover and use other possibilities.
 - Urban agriculture helps to develop and improve interpersonal relations.
 - The management of the space benefits the citizens directly.
- Urban agriculture promotes community participation.

Urban agriculture should be treated as an activity in which the primary actors are the government and the community, both having specific roles and gaining mutual benefits.

4. As an urban function, at what work scale should urban agriculture be undertaken and on what bases?
- The city's diversity and the homogeneity of existing spaces should be taken into account, as determined by the potential of the land and its characteristics.
 - Ciudad de La Habana province is considered a strictly urban province, but it has a peri-urban area with characteristics similar to a rural environment. It is necessary to keep in mind that parts of Havana are developed areas, others are being developed and some are not suitable for development. It is also important to distinguish between the forms of urban agriculture in the different types of zones, from the most developed areas to the least developed spaces on the city's outskirts.

- Urban agricultural development requires a specific design, adapted to the urban space and environment. It is necessary to seek alternative solutions to problems such as water, which is more feasible on a local scale.
- Urban agriculture must be addressed as a permanent urban function with different treatments according to the zones, either central, intermediate or outside the city, as well as on a general and a local scale.
- The treatment of urban agriculture as a permanent function does not exclude the use of specific spaces set aside for other purposes (this is the difference between urban agriculture and other urban functions, and the difference between urban agriculture and rural agriculture). However, the use of these spaces allocated for other purposes should occur only in specific cases and for a set period of time.

Urban agriculture should be treated within the land management system on a large and medium scale in the city, and also in the urban development design, taking into account its specific nature and its links with other urban sectors.

5. With what urban components might urban agriculture bring about a mutually beneficial relationship?

When interacting with the urban structure, urban agriculture seeks to establish various links which, if well developed and enhanced, may lead to important economic, social, environmental and land-use processes.

Urban Agriculture

Specialization
Diversification

Urban Agriculture

User confidence
Job creation
Job stability

Tourism

Substitute imports
Competencies. Specialized restaurants
New tourism modes (demonstration gardens, one-day work farms, multi-crop farms...)

Housing

New design elements
Food security
Employment

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Organic matter production	Healthy occupation for the elderly and for children... Improved environment Introduction of alternative techniques, organic matter recycling, energy, improved water usage...
Urban Agriculture	Industry
Products	New products (canning)
Ensure market supply	Specialization in sophisticated products for specific age groups
Urban Agriculture	Education
Development	Environmental education
Enhancement	Knowledge of products and nutrition
Resources	Development of traditions Training of technicians New specialties Use/sharing of global knowledge
Urban Agriculture	Community Economy
Continuity	Employment Trade Direct consumption
Urban Agriculture	Water
Water supply for irrigation	Windmills, wells, pipelines, and capturing of rainwater. Gray water treatment Water savings Bio-climatic housing
Environmental awareness	
Urban Agriculture	Energy
Appropriate technologies	Savings
Urban Agriculture	Recycling
Improved soils	Resource savings, raw materials
Community commitment	Social and spiritual development Reducing the city energy bill
Urban Agriculture	Other
	Increasing the green mass per inhabitant Hygienic and health improvement

Both the city and the urban agriculture sector gain through a mutually beneficial relationship.

6. How can urban agriculture be included in the land management process? What elements are to be considered and how can this process be addressed?
- It is important to visualize urban agriculture as part of the physical planning system and to find an integrating conceptual framework for a common language among the institutions directly or indirectly related to urban agriculture and to the city.
 - In this context, it is important to separate the concept of urban agricultural management. Only after knowing what we expect of urban agriculture in each place, will we be able to address the question of who will manage it and how.
 - Urban agriculture should be addressed within the land management system not only on the basis of what it is now but following the recommendations of research studies for the future, including what we have learnt from past experiences in Cuba.
 - By considering urban agriculture only as a productive activity, we run the risk of excluding all other urban agriculture potential, such as involvement in the community participatory process, environmental education, and re-use of urban waste. It is an activity generating twofold benefits – for the urban agricultural sector and for the urban environment.
 - The role of urban agriculture in the housing sector goes beyond improving the image of the areas outside the houses. It has an impact on a higher scale and occupies an important place in the local economy.
 - At the general city level, the concept of urban agriculture within the physical planning system is most valuable. At the level of project and design (neighbourhood, zone) it will be necessary to study and assess the availability of resources, infrastructure, actors involved, and other uses and linkages.
 - By including urban agriculture as part of the Green System, it would be possible in the Cuban context to use its full contribution to food security and go beyond the productive dimension to become part of the urban environment, fulfilling, at the same time, the different functions required by the economy, the people and the urban structure.

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- The Green System aims at linking zones with different functions, generating spaces with different uses; improving on problems such as air pollution, noise, access to other urban spaces, and promoting healthier production and recreational activities.

The Cuban case shows that the best way of addressing urban agriculture within the land management system is to include it in the Green System.

Urban Agriculture as a Component of the City's Green System

The city seeks green spaces emanating vitality and beauty for enriching existing spaces and responding to the citizens' needs for a new distribution of urban spaces and better quality of life. That is why it is important to organize the different spaces by ensuring their individuality and their unique formal, dimensional and qualitative differences.⁵

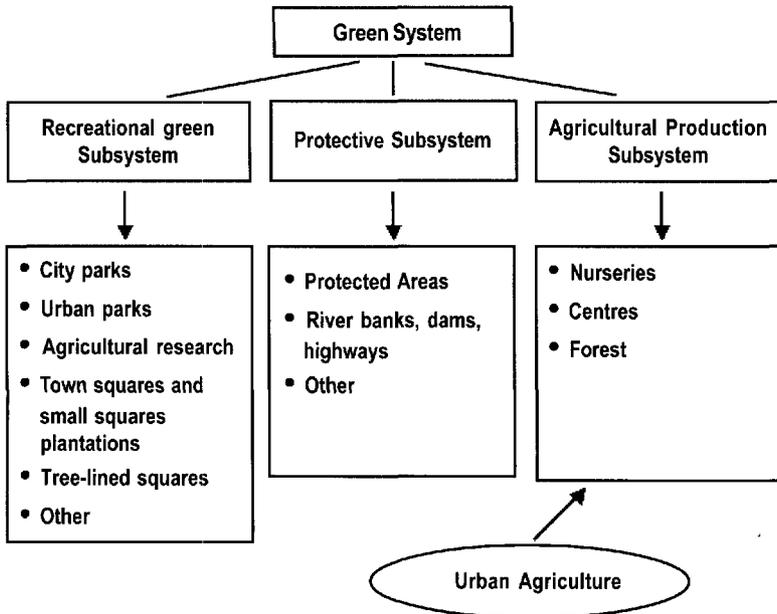
The Green System is based on the principle of linkages and continuity of the green spaces to ensure uses and functions according to their locations. Green spaces link urban networks and have a very important meaning for the city's image and operations.⁶

In order to address urban agriculture as part of the Green System, it is necessary to define its roles within this system in a flexible, easily implemented work plan.

As part of the Green System, urban agriculture will be able to have an integrated set of activities and reach its full potential, with the flexibility to include new elements in the system.

Addressing urban agriculture in this context requires a series of definitions, some of which were discussed during the workshop. The workshop evaluation also recommends further studies on the subject in order to establish a methodological basis for inserting urban agriculture into the Green System. This first phase of the work on definitions is summarized below.

Currently, Havana's Green System includes three subsystems that, although linked together, have their own spatial and operational requirements, with the following main components:



The evaluation carried out showed that it was more convenient to insert urban agriculture into the existing agricultural production subsystem instead of creating a new subsystem. However, this would involve redefining the agricultural production subsystem to include the following:

- To define the concept of a green area (valid for the whole system).
- To establish its components and types of spaces.
 - Linkages among the different components.
 - Identification of local components and their linkages.
 - Economic and environmental indicators.
 - Legal framework, urban rules and regulations.
 - Characterization of spaces where, among other issues, it would be necessary to address the question of the value of the soil beyond its agricultural production potential.
 - Management (who manages it and how)
 - Land ownership issues.
 - Access to land for producers.
 - Incentives (establishing, maintaining and developing phases).
 - Others.

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Of the list of elements in the Agricultural Production Subsystem that need to be re-defined, only the first two were addressed in this book.

The Concept of Green Area

The research showed that several definitions exist for 'green area' or related terms, such as 'free area' and 'exterior spaces'. There is a need, therefore, to find a common language by reviewing the literature on this topic and broadening the scope of the research.

Free area: All those areas with no buildings and those areas belonging to schools or similar institutions, which are for their own exclusive use and for roads.

Exterior spaces: Any uncovered space that has a functional or spiritual meaning for people.

Green Area: Any space that is totally or partially covered by vegetation and has a specific function in the urban structure.

Proposal on the Components of the Agricultural Productive Subsystem and Types of spaces. Classification Criteria

A classification of the Green System's components (urban agriculture included) can be done in different ways. This shows the multiple functions that the agricultural productive subsystem would have and the activities that it could generate. The evaluation also showed the possibility of grouping them under one classification based on the following:

1. Land ownership (state, private, cooperative, for the beneficial use of...).
2. Its relation to other urban functions (residential, industrial, educational...).
3. The main destination of the production (subsistence, consumption by producers, trade, production services, combinations...).
4. The actors involved (family, community, paid workers, women, young people, children, elderly, field workers...).
5. The primary agriculture/livestock use (nurseries, forestry, cattle-raising, several crops, medicinal plants and cooking herbs...).
6. The technological mode (organoponics, hydroponics, intensive-cultivation garden, community garden, backyards, gardens and roofs, conventional or extensive planting...).
7. The scale (large scale: designs, governing plans; medium scale: special plans and urban development plans; local scale: mini-locations...).

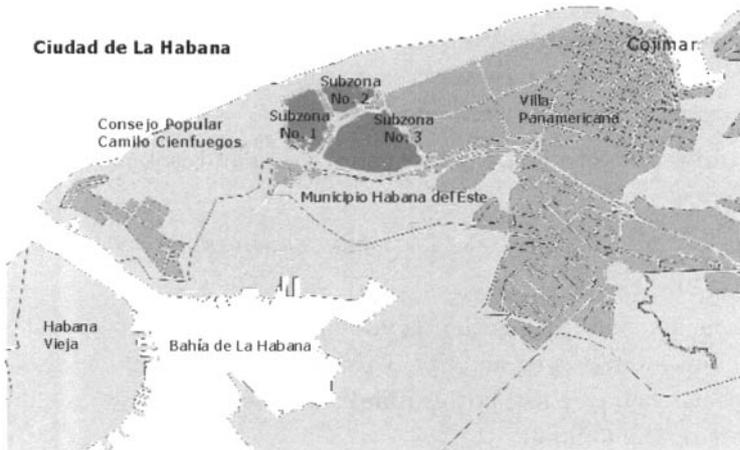
General Criteria for Inserting Urban Agriculture into the Land Management System in a Prospective Housing Development Zone: Camilo Cienfuegos

As an approach to focus on a more precise scale, the Camilo Cienfuegos study zone was chosen because of the presence of urban agriculture in this area, the way it was developed and because it was planned for housing development as set down in Havana's land management program. That is why we need to establish the criteria for a successful insertion of urban agriculture into productive activities. A well-designed and well-planned insertion of urban agriculture will help to improve the quality of the environment in this new use of the area.

From the definition of the different types of subzones, the urban physical design restrictions and potentials in each of them were identified. The study was focused on the following:

- Analysis of the current use of the soil. It included public, semi-public and private spaces.
- A diagnostics of agricultural activities in the zone (resulting from the research project).
- Evaluation of the prospective use of the land.
- Integration of the prospective and current use of the land (including urban agriculture). Conflict evaluations

Subzone Types. Main Characteristics



Subzone 1: Declared national heritage. Buildings from 5 to 12 storeys. It has well established green spaces, constructions, infrastructure and

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and other features. Any intervention in this subzone should be made in accordance with its category as a national heritage.

Subzone 2: Buildings of from 5 to 12 storeys; infrastructure and constructions are completed but not the green areas. The interventions in this subzone 2 should be studied case by case.

Subzone 3: Virtually not built. There is a proposal for new housing development. Urban agriculture is established. It is necessary to combine project, design and new uses.

General Criteria Proposed for all the Subzones

1. To make use of the urban agriculture potential in any future design:
 - Special crops with high economic and nutritional value.
 - Community gardens.
 - Recreational gardens.
 - Recovery of traditional practices.
 - Certified organic production for eco-restaurants.
 - Temporary agricultural use of spaces intended for other urban functions.
 - Cultivation of non-traditional fresh vegetables, flowers, cactuses and other ornamental plants.
 - Sightseeing areas and demonstration plots.
 - Other.
2. Include urban agriculture modes wherever possible, but considering the specific characteristics in each subzone (Parque Histórico-Militar, tourism, protected areas, and others).
3. Cultivate medicinal plants, aromatic herbs and cooking herbs in small spaces.
4. Include alternative modes for using, re-using and recycling water and organic matter.
5. Consider small-livestock production as an option, provided it is not a pollution-producing activity. This is defined not only by the animal species being raised but especially by the technology to be used in raising the animals.

More Specific Criteria by Subzone

- A. For the consolidated urban area: Subzones 1 (national heritage) and 2 (with all the buildings but with the green areas not yet completed):
 1. Promote the use of space in the basements of buildings for agricultural activities using permaculture types of designs.
 2. Promote screening and domestic recycling of organic matter for the productive areas.
 3. Transform the green areas into productive green spaces in Subzone 2.
 4. Consider planting fruit trees of species appropriate to the design of public spaces in Subzone 2.
 5. Foster the cultivation of medicinal plants, aromatic herbs and cooking herbs on roofs and balconies of the subzone declared National Heritage.
 6. Make the green mass resulting from green areas maintenance available for preparation of organic compounds in the productive areas.
 7. Use no agrochemicals in the productive green areas.
 8. Consider alternative solutions for the use of rainwater, especially from the downpipes of buildings.
 9. Consider ways of passing the knowledge on to the new generations.
- B. For the area of prospective housing. Subzone 3:
 1. Planning of the zone should include participatory design techniques.
 2. The design of groups of houses should include several types of communal productive spaces.
 3. Productive units should be kept consolidated: El Pedregal Intensive-Cultivation Garden and Farmers of El Paraíso.
 4. Productive plots should have a coherent design, including such components as image, organic matter recycling and water for irrigation.
 5. Productive agricultural activities and processing methods that support the development of the local economy should be given priority.

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6. The highest possible diversity of productive spaces and a high level of diversity within the productive spaces should be promoted.
7. As a protection against cold fronts, a green area should be established and the selection of species should be suitable to the zone's biogeographic features, giving priority to fruit trees for the protection of wildlife.
8. The use of large spaces for agricultural activities, including grazing should be discouraged.
9. The use of cultivation houses, greenhouses and similar facilities should be expanded beyond their production activities to include others that could benefit the population's most vulnerable sectors, such as elderly people, and handicapped children and adolescents.

General Considerations

Urban managers and planners are focusing their attention not only on the proven possibilities of urban agriculture but also on its untapped potential. The current thinking among experts in the field is that urban agriculture is a viable function for attaining the goals of urban sustainability.⁷ The fact is that urban agriculture is growing more and more in our cities and we have the challenge of managing it as part of the solution to our needs. But the most important challenge is to include in the land management processes those who are the very essence of the city: its citizens.

Inserting urban agriculture into the land management system is not a task to be worked out on a drawing board. It depends, to a great extent, as we have already said, on the interrelation among planners and doers, the community and governments. The role of city planners and developers in this respect should not be limited to ensuring the availability of spaces for agricultural activities. They should also be involved in defining scales, activities and tools that would promote the insertion of urban agriculture into land management.

In this regard, the meaning of urban agriculture as an urban function has to be oriented as follows:

- Work on the different planning scales.
- Coherent relationship among production, location, design.
- Identification and use of linkages and work flows.
- Identification and execution of actions ensuring the evolution of urban agriculture towards sustainability.

The impact should be at the three levels:

- Nation, province and municipality. Vision: contribution to policy-making and policy-adoption.
- Municipal/urban. Land management: zoning, urban-planning design, inclusion in Strategic Plan (use of the Geographic Information System).
- Urban and local. Standards: designs, leasing contracts, environmental legislation.

Although this is an ongoing project, the results obtained thus far have been useful to let us know where we are now and where we want to be. Historical conditions in Cuba have favoured the large-scale development of urban agriculture, but there are obstacles to its development. As for the Latin-American and Caribbean region, this work opens new possibilities for expanding the promotion, research, and definition of the best and most sustainable ways of inserting urban agriculture into the urban environment. It is necessary to have a higher level of commitment from the different governments and the institutions working with the community, so that the agencies involved in developing and promoting the benefits of urban agriculture may have a more complete understanding of the enterprise.

Notes

1. Eneyde Ponce de León and María Caridad Cruz Hernández, 'Sistema verde y producción agrícola en la capital'. Instituto de Planificación Física, November 1985. Publicación de la I Jornada Científica Internacional sobre Planificación Regional y Urbana. Havana, Cuba.
2. Ibid.
3. Ministry of Agriculture. *Lineamientos para los subprogramas de la Agricultura Urbana para el año 2001 y sistema evaluativo*. Havana, Agroinform, 2000.
4. Mario González Novo. 'Institucionalización de la Agricultura Urbana en la ciudad de La Habana'. April 2000.
5. Eneyde Ponce de León. 'Políticas territoriales para el Esquema de Ordenamiento Territorial de la Ciudad de la Habana, 1998'. Havana, Dirección Provincial de Planificación Física, 1998.
6. Ibid.

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7. Jorge Peña. 'Estructura sustentable de la Agricultura Urbana'. Havana, Centro de Estudios Urbanos del ISPJAE. January 2001; Eneyde Ponce de León. 'El verde al rescate de la ciudad'. Paper presented at the Seminario Internacional Ecocity Ecuador. Quito, July 2001.

Chapter IX

MAIN RESULTS AND IMPACT OF THE RESEARCH PROJECT

In November 1999, the Urban Agriculture Programme 'Cities Feeding People' of the International Development Research Centre (IDRC) published the results of a workshop in which the impact of several projects developed in Latin America and the Caribbean region was evaluated.¹ When this workshop was carried out, at the end of May 1999, the research project 'Evaluation of Urban Agriculture as a component of the local economy in two areas of Havana, Cuba' (97-0008 FUNAT Cuba) was eleven months old. This chapter attempts to summarize the results and impact of the project during its three years of work.

1. *Agricultura Urbana en América Latina y el Caribe. Impactos de proyectos de investigación.* Taller Investigando el Desarrollo de la Agricultura Urbana en la América Latina y el Caribe. Balance y Optimización de Impactos de Proyectos. San José, Costa Rica, May 23–27, 1999. IDRC/FLACSO, November 1999.

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This research project has been carried out by the Fundación Antonio Núñez Jiménez de la Naturaleza y el Hombre (FANJ) together with several institutions, specialists, and producers. The project is part of the enhancement programme of the urban agriculture sector, which has grown significantly in Havana. In this context, any action at the research level has had a direct effect, to a lesser or greater extent, on the specific activities performed by the actors involved and, indirectly, in broadening the scope of their respective areas of work.

The project did not seek to obtain isolated results and impacts, however relevant they might have been, but rather to provide continuity for the urban agriculture enhancement process by using new approaches, criteria and alternatives for solving existing problems. That is why the FANJ has oriented its work toward the creation of an Inter-Institutional and Multidisciplinary Research Team.

The Fundación Antonio Núñez Jiménez's research team has been working for five years now in its Urban Agriculture Programme. Among the many activities carried out by this programme is the provision of training in permaculture to more than 300 producers and technicians, with the goal of achieving a greater level of integration between the urban environment and agriculture. The Urban Agriculture Programme has also provided assistance within and outside Cuba to the development of urban agriculture in the Latin American and Caribbean region and has provided support to other institutions in tasks related to urban agriculture.

There is no doubt that the research project – the first of this nature for the Foundation's Urban Agriculture Program – will bring valuable experience to the institution and will become an important tool for ensuring the continuity of its activities.

Definition of Components Included in the Evaluation

Human Resources Development: Improving abilities and skills either during or as a result of the project by means of minicourses, dissemination and sharing of information or any other form of collaboration with formal research.

Strengthening of the Institutional Capacity: Equipping, reconditioning, improving or renovating equipment, programmes, literature, administrative and management systems, consultancies or support with services and know-how.

Effectiveness of the Local Collaboration: Working relationships with other organizations or institutions, whether related to the research or not.

Awareness of the Gender Approach: Awareness of the need to include a gender approach in the activities and the manner in which this approach can be applied.

Contribution of the Multidisciplinary Approach: Benefits that were improved as a result of applying a multidisciplinary approach or benefits maintained that would otherwise have been lost or reduced.

Scientific and Methodological Progress: Innovative designs, application of new guidelines, evaluation or transfer of these new elements.

Benefits in Terms of the Results: Use made of the project's findings or products by institutions or organizations; contribution to policy-making. Development of new processes that were somehow influenced, partially or totally, by the progress of the research.

Funds and Resources: Ability to generate income or financial or technical or organizational support resources for the future leverage of the research itself or for the organization that has developed the research in order to produce that process.

Outcome and Impact on each of the Components Included in the Evaluation

Human Resources Development

The training of human resources in urban agriculture in Havana cannot be seen as a process connected with specific results or particular projects or actions. Human resources training has been part of an ongoing process involving numerous institutions and people in a gradual and systematic process, although mainly sectoral in scope.

This research project is part of the ongoing process. Its scope and objectives go beyond the narrow framework concerning technological systems and/or technical problems of agricultural production on which the development of this activity has been centred until now. This research project contributes a new vision and a new way of addressing urban agriculture that is more in line with the urban environment in which the activity takes place.

The training of human resources was also the result of exchanges and discussions among the individuals and institutions involved in the seven workshops and more than 40 working meetings and consultations held during the research work, in which not only the professionals in the research team, who represented different institutions, were involved but also other technicians working directly in the production areas of the city.

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Similar links have also been established with other institutions and government bodies, either in the quest for information or through interviews with producers and consumers in the areas of Camilo Cienfuegos People's Council and Havana's Parque Metropolitano.

As a result of this learning process, the institutions, specialists and producers involved in the research team are now prepared to do the following:

- Implement research projects using a combination of criteria from several disciplines.
- Provide technicians and producers with a more integral concept of the urban agricultural function.
- Evaluate the implications of a sectoral management of urban agriculture in a more objective and comprehensive manner.
- Recognize the actors within the population who should be included in urban management and in economic, technical, agricultural, environmental and other types of evaluations, as required by the current status of this urban function.
- Include a gender approach.
- Seek the harmonious and permanent insertion of urban agriculture in the urban environment.
- Apply a wider scope for evaluating the investment emerging from this new function.

The approaches and tools used and the indicators developed, as well as the results obtained in several areas of work, have had a great value and a potential for rapid expansion in the Cuban context. This outcome is due to the high level of education in Cuba, where the general minimum level of schooling is Grade Nine.

On the other hand, the application of such approaches, instruments and indicators shows the possibility and the need to develop specific mechanisms for planning, following-up and evaluating the different modes of urban agriculture at the local level.

Another benefit of the project has been the professional advancement of the research team members through their participation in workshops, courses and seminars held in other countries in the region. The project was the direct beneficiary of these results, since the members of the research team brought back to the project the newly learned methods, tools, viewpoints, which also contributed to reaffirming and refining the

differences and similarities of the urban agricultural development in Cuba to that of other countries.

Concerning human resources training, the work of the research project expanded beyond Cuba with the dissemination and exchange of information, the search for a common language and for a conceptual framework for urban agriculture.

The recognition by other institutions of the level of preparation of the FANJ technicians and other members of the research team has increased the possibilities of collaboration with other entities. One such example is the assistance provided to the municipalities of Cuenca (Ecuador) and Santiago de los Caballeros (Dominican Republic) for the design and implementation of urban agriculture programmes for these cities, with successful results.

Strengthening the Institutional Capacity

Because of the serious economic problems that Cuba faced during the 1990s, the shortage of material resources available to the institutions forced them to focus their attention on strengthening their capacities for current and future work and, above all, on making the best possible use of the valuable technical human resources trained in more than 40 years of free education in all the centres and at all the educational levels available in Cuba.

The Fundación Antonio Núñez Jiménez de la Naturaleza y el Hombre is a non-profit, non-governmental organization that was created in 1994. The securing of material resources by the research project increased the possibilities of its implementation and made other related work in the same areas easier to carry out. For instance, the expansion of the working objectives for the urban agriculture program and the preparation, submission and approval of projects during this period.

As a result of the training of FANJ technicians in the research field and the coordinating actions required by the research project, the institution has strengthened its capacity to have an impact on urban agriculture development issues in the country and in the region. The capacity building at the institutional and professional levels has been enhanced by the strong relationships established with other national and international institutions and agencies during the research process.

The FANJ was in a good position (material and human resources and inter-institutional relations) to organize the meeting of the AGUILA network regional project in Havana (September 1998) and the II Assembly

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of the AGUILA Network (November 1999) and for disseminating and exchanging information on the research in numerous events held within and outside Cuba.

The availability of material resources and the training of human resources in activities such as workshops, the design and application of participatory techniques for capturing and analyzing data, and participation in the events and projects mentioned above strengthened the institutions, specialists and producers involved in the research team, and its collaborators.

Effectiveness of the Local Collaboration

The institutions that are represented in the research team and others, such as the Water Directorate, the Faculty of Geography, the Group for the Integral Development of Havana, the Centre for Urban Studies of Havana's Polytechnic Superior Institute, the Cuban Association of Livestock Production and the Community Project for the Conservation of Food, among others, have been assisting in one way or another in the implementation of this project and, in several ways, in the development of urban agriculture in Havana and in other Cuban cities.

The promotion of this collaboration has been fostered in part by government departments. The research project has been instrumental in further consolidating these forms of collaboration, with the possibility of achieving an even greater level of integration in the future work on urban agriculture and including new criteria for the enhancement of urban agriculture in Cuba and, especially, in Havana.

Working together on the implementation of the research project activities, such as screening and recycling the household organic waste in one of the areas under study, made it possible to strengthen the relationships among the team members, producers, consumers and the local government. This experience shows important benefits acquired as a result of the implementation of the project (soil improvement, development of environmental education, decrease in the volume of waste to be transported, inclusion of other sources of organic matter, among others) not only in the immediate area of the project but also in other areas of the city.

It is important to note that, during this period of the implementation of the research project and as a result of the work carried out, collaboration with other institutions in the country has improved: for instance, such institutions as the European Studies Centre (Centro de Estudios de Europa)

and the Ministry of Collaboration and Foreign Investment (Ministerio de la Colaboración y de la Inversión Extranjera), which work with the Cuban NGOs in seeking support from abroad for the implementation of projects. Relations with project representatives and foreign organizations located in Cuba have also been strengthened. A summary of the results described above can be found in the sections of this chapter devoted to Areas of Impact and Securing Funds and Resources.

Awareness of the Gender Approach

The living conditions for Cuban women are better than those in many countries in the region, and that is why gender has not been included in the past in many research works and in other studies. Even the way of addressing this subject is still unknown. In this context, the research team saw the need for learning about the subject through workshops and consultations held with the support of IDRC and Cuban experts, in order to reverse this situation.

Throughout the document outlining the results of the project, the presence of women and other segments of the population in the development of urban agriculture is evident, taking into account the Cuban context concerning gender issues and the information available in Cuba, in Havana and, especially, in the areas under study.

Although the project initially did not seek a balanced proportion of men and women in the research team, in practice 47 per cent of the research team are women. This is a significant sample of the situation among the general population, where 64 per cent of the technical work force in Cuba are women. It is precisely at the technical level where we find higher participation by women in urban agriculture, but at both extremes – at the higher management level and in direct production activities – this percentage starts to decrease.

The evaluation shows that the best results of the research work that has been carried out on gender issues are those pointing to the lack of information, except in the two regions under study, especially concerning the participation of women in direct production activities among the elderly in general and, within this age group, among men and women who live alone and therefore are more vulnerable.

The lack of information in terms of figures and also with respect to the identification of the objectives, needs and interests of all the population segments mentioned above is the result of inadequate studies on the issue. In this context, the research team and the institutions involved in the

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project considered that it was important to include this subject in any future work by the research teams and the participating institutions.

Contribution of the Multi-disciplinary Approach

The results obtained about urban agriculture in Havana are relevant. However, they present the problem of not having applied a fully multi-disciplinary approach to the production components and to other equally important aspects such as the rate of return, the use of urban soil, solutions concerning water for irrigation purposes, reuse of the household organic waste and the establishment of mutually beneficial relations with the city beyond contributions to food security.

But even with these shortcomings, in addressing these and other problems, the research project has taken into account the criteria and interests of several disciplines and the integration of all of them in Cuba and in the activities carried out on Cuban soil. One important component in this regard was the participation of producers in the study. Noting the gaps and possible solutions, it is also a result of a multi-disciplinary approach and possibly one of the most important contributions of the research.

The development and implementation of the project produced an impact on the way in which, with a few specific exceptions, the subject of urban agriculture in Cuba has been addressed over the last ten years. It has been limited to institutions and professionals of the agriculture-livestock sector.

The involvement, over time, of an increasing number of collaborators and institutions represented in the research team, can be measured by their participation in workshops and working meetings, as well as in the information sources used and the reports prepared. These results supported the view held by the research team that the implementation of the project required the application of an integral multi-disciplinary approach.

Scientific and Methodological Progress

The research project is the first experience in Havana and possibly in Cuba (no information on any similar project has been found) of addressing urban agriculture in an integral manner and specifically considering its relations with the urban environment.

The results obtained in the different work areas, such as the possible ways of inserting urban agriculture in the land management system, the evaluation of efficiency in each of the urban agriculture production modes, the producers-consumers relations established for the recycling of organic

matter and its use as a tool for promoting environmental education, are innovative methods for enhancing urban agricultural practices in Havana and in Cuba as a whole.

The identification of ways to achieve a higher level of economic and environmental sustainability for urban agriculture and its insertion as a component of the local economy are also innovative dimensions in our context. However, this document also presents weaknesses and challenges that require further and deeper analysis. These weaknesses and challenges in the research process have been included as a basis for establishing long-term goals.

The diversity of experts involved in the research made it possible, in many cases, to carry out objective group analyses from elements that the group itself defined. These analyses were used to close information gaps and perform evaluations with an acceptable level of precision. This was a valuable approach for obtaining results that otherwise would have been impossible to obtain and it also prepared the ground for future work.

The exchanges and dissemination of information carried out during the whole working process allowed us to obtain, and use feedback from different sources, and to have a systematic validation of the results as they were being produced. The sharing of information also provided, among other things, the necessary data to complete work stages and to modify the contents and scope of the subjects addressed as required.

Benefits in Terms of the Results

The institutions represented in the research team, the collaborators and producers involved, and the government departments in the areas under study are now more prepared for enhancing this new urban function and for facing the challenge of its continuity beyond a period of economic crisis.

The relations established among producers, consumers and local government for recycling household organic waste, the ways of inserting urban agriculture in the land management system, the multidisciplinary approach applied into the research, the search for alternative ways of solving the problem of water for irrigation, the analysis of the efficiency of the various urban agriculture modes in Havana, among others, are highly useful tools for the future work of the institutions, producers, and local government officials who were involved in the research.

The results of the research and, particularly, the exchanging and dissemination of information associated with the research process have

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made those results known beyond the national boundaries and are being used as a reference in other projects in the region, permitting comparisons and promoting further information exchanges. Despite the differences in context, it has been possible to identify both the commonalities and the differences in those projects, which is an important contribution for determining gaps in the research that have to be filled at the level of agricultural extension, promotion of training and research, and the different ways of inserting urban agriculture in the urban environment on a permanent basis.

The production of a document containing all the essential issues in the emergence and evolution of urban agriculture, as well as the different ways in which this urban function can be integrated with other urban functions in Havana, is extremely valuable for those seeking a theoretical approach to the subject. It is also useful for those interested in consolidating and enhancing this activity, especially considering that this document includes causes, effects and changes, alongside weaknesses and needs that require further analysis in order to reach concrete objectives, which are also defined in the book.

It is important to point out that during the last year of the research project the FANJ developed the strategic plan of its Urban Agriculture Programme. Knowledge acquired by the project area, the research results and the working relationships established during the implementation phase allowed for the development of a more participatory process that is wider in scope and includes definitions of guidelines, contents and priorities for that programme.

Securing Funds and Resources

The research project has benefited the Fundación Antonio Núñez Jiménez by increasing its possibilities of securing additional resources for strengthening its institutional capacity, in the training provided for its technical personnel for preparing and submitting projects, and in the relations it has been able to conduct with the AGUILA Network and other international institutions.

Projects Supported by the Research Project

- 1. Permaculture Training on nutrition, health and composting in small urban spaces in Havana and Cienfuegos. (Permaculture IV):** The Australian Conservation Foundation learnt about the

preliminary results of this research and decided to allocate funds for this local action project, which is currently being carried out.

- 2. Actions in Permaculture in Havana:** The OXFAM family, specifically OXFAM Great Britain, learnt about the FANJ's urban agriculture programme and decided to fund this project to provide training on Permaculture for agricultural extension officers of the Urban Agriculture Directorate of the Ministry Office, for urban producers and small community groups. The project was completed in November 2000.
- 3. Cuba-Canada Environmental Restoration Project, Year 2:** This ACDI project was carried out between the Evergreen Foundation of Canada, the FANJ and Parque Metropolitano de La Habana (PMH). A main component of this project was the building of the nursery for the Parque Metropolitano. The work undertaken by this research project concerning the PMH was a very important element for developing the proposal of the Cuba-Canada Environmental Restoration Project for its second year. The nursery is a key component in the reforestation programme of the PMH and the city.
- 4. Training and environmental education project for the management of solid waste in a community of Havana's Parque Metropolitano:** The design of this training and environmental education project, financed by the Heinrich Böll Foundation of Germany, included, as a priority, the identification by the participants in the research project of the problem of solid waste, its potential as a source of organic matter and the possible links to urban agriculture processes in the PMH. A group of community people with the knowledge and willingness to implement this community action plan participated in the project, which was completed in the year 2000.
- 5. Project for a magazine *Se Puede Vivir en Ecópolis*:** This quarterly magazine has been in circulation in the country for several years now. It is considered the only popular magazine on environmental matters. It publishes issues of 10,000 copies and is an important means for disseminating information about our Permaculture projects. The research project identified several general areas of influence on agriculture and urban environment dealt with in this magazine.

This context provided the justification for developing a separate project for this magazine. The German NGOs KATE and Puente Norte-Sur

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provide support for the publication of eight issues of the magazine. One of these issues will be devoted to the results obtained by the research project.

General Considerations

The selection of a research project on urban agriculture, from the identification of components that go beyond production is very important in the Cuban context and for other countries as well because it is an activity inserted into the urban environment that demands a totally different approach from that used for the rural environment.

However, although the economic, political and social conditions in Cuba are different from those in the rest of Latin America and the Caribbean region, we all share common interests, such as food shortages for one reason or another; the deterioration and loss of agricultural soils; the importance of using and/or recycling organic waste and water; the need to plan our cities in line with our realities and requirements; to work on the basis of inter-institutional complementarity and to reach a level of community management according to the availability of our own resources. All these reasons increase the value of the project's information exchanges and dissemination, its results and its impacts.

The time that elapsed between the design of the project, the access to and availability of funds and the implementation of the project had a bearing on the research, considering the fact that it was then that a serious economic crisis occurred, the outcome of which was initially impossible to predict. However, the research considered that the main objectives set down for the research had been achieved and that the impact of the changes mentioned was limited to the re-evaluation of certain subjects and to addressing them from the perspective of the real situation and not in terms of speculation or forecast.

The research team considers that that project had no negative impacts, although it is necessary to clarify that, in some of the areas evaluated, the impacts will be seen further on, as the recommendations and proposals emerging from the research results are being applied.

The classification of areas according to level of impact are as follows:

Area of Impact	Relevance	
	After 11 months	At the end of the project
Development of human resources	3	1
Strengthening of Institutional Capacity	1	3
Effectiveness of local collaboration	5	6

Main Results and Impact of the Research Project

Area of Impact	Relevance	
	After 11 months	At the end of the project
Awareness of the gender approach	8	8
Contribution of the multidisciplinary approach	2	2
Scientific and methodological progress	7	5
Benefits in relation to results	6	4
Securing of Funds and Resources	4	7

Although local collaboration was a success, this is not considered a matter of major impact because in Cuba it is not very difficult to obtain this kind of collaboration if it is requested. Concerning the gender approach, it is necessary to explain that, even though important results were brought about by the project, as shown above, the research team thinks that this subject should be addressed in greater depth and with a broader view.

Chapter X

CONCLUSIONS AND RECOMMENDATIONS

The goal of the research team was to include at the end of each chapter the considerations generated from the various aspects and topics therein dealt with. Some of these considerations go beyond the specific aspects studied and have significant value for the integral enhancement of urban agriculture and the great challenges and difficulties in establishing this practice on a permanent basis in our cities.

The results presented in this book, which is the first in our country to apply a comprehensive approach to the study of urban agriculture, can be used as a basis for addressing this practice in a broader context, not restricted to a limited period of time. On the other hand, the identification and description of the limitations and gaps in the information currently available on urban agriculture should not be considered a deficiency of the research, but rather an important finding that sets the direction for future studies.

Various components have been identified that in our context require a higher level of precision in the short term. There are decisions and courses of action to be derived from these components that should be used in establishing the practical basis for assuring the continuation of urban agriculture beyond a period of economic crisis. The research also included other theoretical components that require more time for further development in which constant feedback, a multi-disciplinary approach and participatory engagement will be irreplaceable, whether at the community or the institutional level or both. Continuity in the study and the application of these components are necessary to ensure the integration of this new urban

function with the other functions in the city, in a carefully planned, well-managed and environmentally sound manner.

It has been acknowledged that ten years is not a sufficient period of time for modifying ways of thinking that have been conditioned by forms of production based on the use of agrochemicals, large areas of cultivation, mechanization and the introduction of leading-edge technologies and other factors. With this in mind, a greater investment of capital could give rise to the intensified use of these practices and undo the progress and achievements gained in this period of transition to more sustainable forms of urban and peri-urban agriculture. That is why it is imperative to focus on the enhancement of urban agricultural practices by promoting training, research, dissemination of information and management techniques that are more deeply rooted in agro-ecology, that take into account the interests of the city and that promote the full potential of the mutually beneficial relationship between urban agriculture and the urban environment.

Urban agriculture constitutes one of the possible ways of effecting the transition towards a more sustainable city. In this context, it is extremely important to evaluate the following: the cost-benefit ratio of each one of its components, the maximum use of the resources the city has to offer, the application of those technologies that promote capacity building rather than dependency, the identification of a separate configuration and legal framework for this practice to be applied to the urban physical spaces, actors and objectives, and further research development that would provide support to urban agriculture and improve its practice.

Conclusions and Recommendations from the Final Workshop on the Dissemination of Research Findings

The Fundación Antonio Núñez Jiménez de la Naturaleza y el Hombre held the Final Workshop on the Dissemination of Research Findings in the city of Havana, May 7–9, 2001.

The workshop participants included the members of the research team, collaborators and representatives from various organizations interested in the research results, and also active members of the AGUILA Network from Mexico, Ecuador, Canada, Uruguay and the Dominican Republic who were all involved at some point in the research process. In addition to the general criteria set out by the research team, which have been referred to throughout this book, a number of more specific conclusions and recommendations emerged from the workshop deserving special attention

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for their relevance to current development of urban agriculture in Cuba's capital city. Among the most important ones are the following:

- Urban Agriculture has made an important contribution, in quantity and quality, to food security for the population of the city of Havana.
- The emerging trade opportunities in urban agricultural products have contributed to the development and establishment of this practice.
- There is no doubt that urban agriculture plays a role in the local economy and in the social, aesthetic, environmental, cultural, political and other values.
- Urban agriculture should be considered a permanent urban function and treated as such in the city's land management system and city management in general. This implies the application of a more integrated theoretical-practical management approach, broader than the sectoral approach currently applied to urban agriculture.
- The government management and control system for urban agriculture in Havana emerged as a result of the development reached by this productive activity, but after the initial period it started to have an influence on the evolution of urban agriculture.
- Gender-related issues in urban agriculture need and deserve treatment that is more far-reaching than assessing the direct participation of women in quantitative terms in production or technical activities. It is important to include gender-related issues in the various modes of urban agricultural practice.
- The issue of water for irrigation in urban agriculture requires further research and projects. It is vitally important that alternative solutions to the use of the population's regular water supply for irrigation purposes be proposed and implemented in order to ensure a permanent role for this productive activity.
- The flexible nature of the methodology used in this research study allowed the research team to include innovative techniques and methods during the working process and address urban agriculture in an integrated manner, considering it in relation to the urban environment and the actors and institutions functioning in that environment.
- Future research studies dealing with the community economy should include the components, relationships and flows of the informal economy.

Conclusions and Recommendations

- The inclusion of urban agriculture at all levels of the education system would contribute to the creation of a culture of agriculture among younger generations, thus favouring a permanent role for this activity.
- There should be an increase in the studies of urban agriculture in the Latin American region, and the publication of the research results through various means should also be promoted.
- This book should be used as a reference tool in courses and workshops related to urban agriculture, especially in those fostering a transition towards more environmentally sustainable cities.

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