



## Diagnosis of productive scenarios, spaces for local food production Diagnóstico de escenarios productivos, espacios para la producción local de alimentos

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**ABSTRACT:** Cuban agriculture currently faces a challenge, it produces healthy, safe and accessible food for society, it does not matter in which space this activity is carried out, the important thing is that food sustainability is achieved and that it contributes to preserving the environment and the natural resources. In this sense, local agricultural innovation and agroecology play a preponderant role. The present study was carried out with the objective of knowing the agricultural situation of courtyard, orchards, farms and plots, incorporated into the movement of urban, suburban and family agriculture of the Zaragoza Popular Council, in San José de las Lajas municipality, Mayabeque province. It began with a participatory diagnosis with a gender approach, applying a survey, which added as indicators: available land, diversity of crops, training needs in local agricultural innovation and agroecology. As a result, it was obtained that 35 % of the farmers did not have the necessary land. The diversity of existing crops was evidenced, highlighting the production of viands, grains, vegetables, medicinal and seasoning plants, as well as backyard animals. The main training topics of interest were known, which were related to the production and conservation of seeds, use of bioproducts, as well as the management and production of fruit trees. It is concluded that the applied diagnosis allowed establishing a work strategy, developing the training program and advising these farmers to increase food production on agroecological bases, based on local agricultural innovation.

**Key words:** urban agriculture, agrobiodiversity, training, crops, food sovereignty.

**RESUMEN:** La agricultura cubana tiene un reto en la actualidad, producir alimentos sanos, inocuos y accesibles para la sociedad, no importa en qué espacio se realice esta actividad, lo importante es que se logre una sostenibilidad alimentaria y se contribuya a preservar el medio ambiente y los recursos naturales. En este sentido, la innovación agropecuaria local y la agroecología juegan un papel preponderante. El presente estudio se realizó con el objetivo de conocer la diversidad agrícola de patios, huertos, fincas y parcelas, incorporadas al movimiento de la agricultura urbana, suburbana y familiar en el Consejo Popular Zaragoza, perteneciente al municipio de San José de las Lajas, provincia Mayabeque. Se comenzó con un diagnóstico participativo con enfoque de género, aplicando una encuesta, que incluyó como indicadores: tierras disponibles, diversidad de cultivos, necesidades de capacitación e interés en la innovación agropecuaria local y la agroecología. Como resultados se obtuvo que el 35 % de los agricultores no disponían de tierras suficientes. Se evidenció la diversidad de cultivos existentes, destacándose la producción de viandas, granos, hortalizas, plantas medicinales y condimenticias, así como animales de traspatios. Se conocieron los principales temas de capacitación de interés, los cuales estuvieron relacionados con la producción y conservación de semillas, uso de bioproductos, así como el manejo y producción de frutales. Se concluye que el diagnóstico aplicado permitió establecer una estrategia de trabajo, se elaboró un programa de capacitación y se brindó asesoría a los agricultores para incrementar la producción de alimentos sobre bases agroecológicas, a partir de la innovación agropecuaria local.

**Palabras clave:** agricultura urbana, agrobiodiversidad, capacitación, cultivos, soberanía alimentaria.

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## INTRODUCTION

Food is a basic biological factor for survival, but for humans it goes far beyond mere subsistence (1). Current research suggests that our ability to cook has played a vital role in the evolution of our brains and thus our species, by being able to extract maximum energy from nutrients with minimum effort (2). Traditions and habits contribute to enriching the knowledge of what is safe to eat or not, and make possible ways of being able to eat most of the time, while at the same time allowing people's lives to develop (3).

Some data provided by the FAO show that, in 2019, one out of every 10 people worldwide was exposed to food insecurity. An estimated 2 billion people did not have regular access to safe, nutritious and sufficient food. Specifically in Latin America and the Caribbean, this insecurity increased from 2014 (22.9 %) to 2019 (31.7 %), demonstrating that much remains to be done to reduce hunger and ensure access by all families to healthy and nutritious food (4). In this sense, sustainable agriculture based on agro-ecological concerns for food sustainability in harmony with the environment, trying to impact as little as possible and enhancing agrobiodiversity. Urban, suburban and family farming (AUSUByF) plays a key role; that is, it represents a transformation from the conventional production/consumption/trade approach so that people in communities can access healthy food. In demanding better nutrition, social organizations seek to gain space by recovering abandoned land and social cohesion; highlighting the participation of women as managers and promoters of activities in their communities (5).

Cuban agriculture has a challenge today, to produce food that is healthy, safe and accessible to society. No matter in which space this activity is carried out, a farm, a yard, a plot or an orchard, the important thing is to achieve food sustainability and contribute to preserving the environment and natural resources. But despite the transformations that have been made in Cuban agriculture, and particularly those that have been implemented in the cooperative agricultural sector, there are still some difficulties which hinder its normal development (6).

The Urban, Suburban and Family Agriculture System in Cuba represents a fundamental source of food for the Cuban population. People show a high level of satisfaction with the products marketed under this system, mainly because it provides communities with fresh, healthy and diverse food. But the system must still be maintained and improved in the localities, because of the possibility to purchase products that are preferred by the community's neighbors, as well as the variety, quality and affordable prices of these products (7).

Despite efforts, challenges remain to achieve food security in Cuba and the population does not have constant access to food. Food sovereignty prioritizes local economies, local, national markets, empowers the peasantry, family farming and places food production, distribution and consumption on the basis of environmental, social and economic sustainability. Food sovereignty promotes transparent trade,

which guarantees a decent income for all and promotes the rights of consumers to control their own food and nutrition (8).

In the speech of Deputy Prime Minister Jorge Luis Tapia Fonseca in April 2021, the PCC's Political Bureau and the Executive Committee of the Minister Council presented and approved: 63 measures to boost food production because "Cuban agriculture does not achieve the levels of production necessary to meet the demand for products for different destinations, there is low productivity of many forms of production, limited application of science and innovation results in productive and service activities, preventing the search for alternative solutions of national production" (9). In turn, it is necessary to promote the design of local development projects between producers and agricultural cooperatives for the joint management of productive activities that increase the added value of primary productions, based on their benefit and industrialization, as well as the provision of technical and marketing services to the productive base. Consolidate food production at the local level, based on the Food Sovereignty and Nutritional Education Program, to ensure municipal self-sufficiency, supported mainly by endogenous resources (10).

In this context of the search for sustainable alternatives, there are key opportunities to transform food production systems where grass-roots movements play an essential role. In this sense, the AUSUByF reaches all those spaces where it is possible to sow, harvest and breed animals on a small scale. The local level can contribute to the accessibility of healthy and safe food for better nutrition. Urban, suburban and family agriculture in Cuba in the current situation of Covid-19, was able to continue with food production because its approaches, technologies and organization are based on the precepts of food sovereignty (11). Commitment to food sovereignty through community development projects and municipal self-sufficiency (12).

Taking into account the above approaches, the aim was to identify and characterize the agricultural diversity of courtyards, orchards, farms and plots incorporated in the urban agriculture movement, suburban and family of the Popular Council of Zaragoza in San José de las Lajas municipality, Mayabeque province, Cuba.

## MATERIALS AND METHODS

The work was carried out in communities of the Popular Council of Zaragoza in San José de las Lajas municipality, Mayabeque province, Cuba. A participatory diagnosis was carried out with a gender Twenty two production sites (yards, farms, orchards and plots) were visited and 20 of these were selected to work directly. The current situation of the production areas was noted. This selection was intentional based on the surveys carried out by the representative of urban agriculture of the people's council. A semi-structured survey was applied, which included as indicators: available land, crop diversity, training needs and interest in local agricultural innovation and agroecology.

Of the 20 production scenarios selected to work directly, a total of 20 people were surveyed, including producers, plot holders, officials who found themselves proportionally represented in 100 % of the popular council in six different settlements. The survey with open questions was used as an instrument and participatory observation, both methods allowed the collection of qualitative and quantitative data at a single time, to know the available land, crop diversity, training needs and interest in local agricultural innovation and agroecology. The surveys were coded and processed, using descriptive statistics.

The Microsoft Excel data processor was used under the Windows 10 operating system. The informal interview with key informants was used for participatory diagnosis with a gender focus in order to know the motivations, needs and aspirations of social actors to produce food on small scales in harmony with the environment

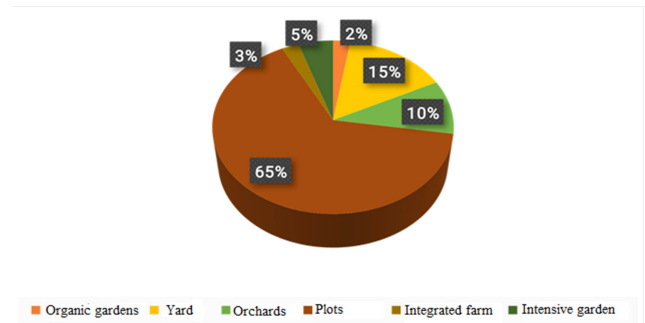
Se empleó el procesador de dato Microsoft Excel bajo el sistema operativo Windows 10. Se utilizó la entrevista informal a informantes claves para el diagnóstico participativo con enfoque de género con el objetivo de conocer las motivaciones, necesidades y aspiraciones de los actores sociales para producir alimentos a pequeñas escalas en armonía con el medio ambiente

## RESULTS AND DISCUSSION

### Available land

The production scenarios were broken down as follows: one organoponic garden, six courtyards, four orchards, 26 plots, two integral farms and two intensive orchards (Figure 1). The largest percentage is represented by plots representing 65 %, which could be attributed to the number of people who are optimizing small areas of land for planting food, mainly vegetables, grains, fruits, vegetables, Medicinal plants and condiments; in smaller quantities, long-cycle crops such as taro are planted. It was found that 35 per cent of farmers did not have sufficient land to develop food production.

The assessment revealed the motivations, needs, and aspirations of social actors to produce food on a small scale



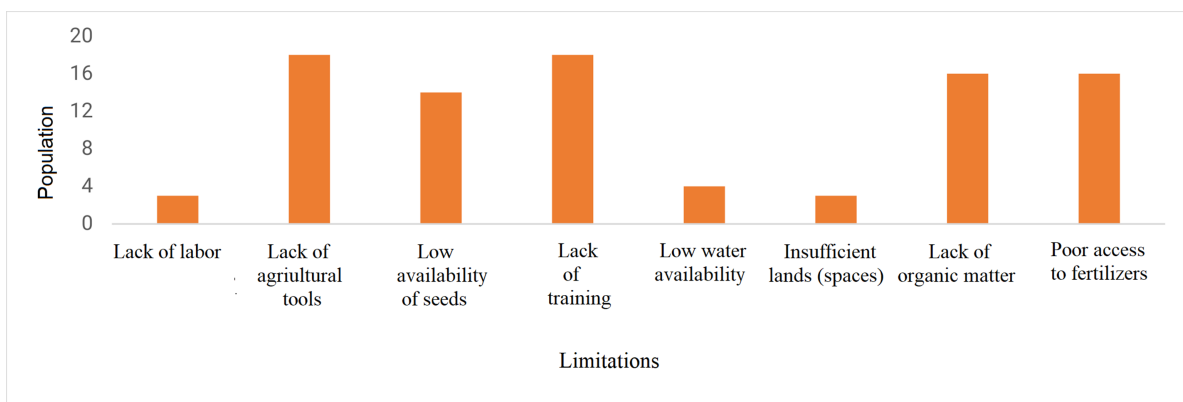
**Figure 1.** Productive forms present in the spaces of AUSUByF of Zaragoza, San José de las Lajas, Mayabeque

in harmony with the environment. Of the 20 people surveyed in the production spaces, seven were led by women, and the remaining 13 by men. A state institution (a mixed primary-secondary school) participated, which contributes to the social responsibility of research centers and universities to support the vocational training and professional guidance of children and young people, in addition to supporting the strengthening of the school garden. By age group, it was found that only one (5 %) was under 20 years old, one (5 %) was between 20 and 30 years old, four (21 %) were between 31 and 50 years old, seven (37 %) were between 51 and 60 years old, and six (32 %) were over 61 years old, demonstrating that few young people are motivated to produce food in small spaces. The most common educational level is secondary (basic secondary) at 72 %, and upper secondary at 28 %.

It was also revealed that agricultural production faces several limitations (Figure 2). 18 % of respondents recognize the lack of implements and training as their main limitations, followed by 14 % who mention the limited availability of organic and mineral fertilizers, as shown in Figure 2.

### Crop Diversity

Table 1 shows the main crops grouped by species. It was evident that various crops converge in the areas where the assessment was carried out, particularly the production of root vegetables, grains, vegetables, medicinal and condimentary plants, as well as backyard animals.



**Figure 2.** Main limitations affecting the productive spaces of AUSUByF in Zaragoza, San José de las Lajas, Mayabeque

**Table 1.** Crops present in the AUSUB and F spaces of Zaragoza, San José de las Lajas, Mayabeque

| No. | Species of plants          | Crops   |
|-----|----------------------------|---|
| 1   | Fruit trees                | Lemon ( <i>Citrus limon</i> (L.) Osbeck), banana ( <i>Musa paradisiaca</i> var. <i>sapientum</i> L.), guava ( <i>Psidium guajava</i> L.), mango ( <i>Mangifera indica</i> L.), sweet orange ( <i>Citrus siniensis</i> (L.) Osbeck), sour orange ( <i>Citrus aurantium</i> L.), avocado ( <i>Persea americana</i> Mill.), papaya ( <i>Carica papaya</i> L.), grapes ( <i>Vitis vinifera</i> L.), custard apple ( <i>Annona cherimola</i> Miller), mamey ( <i>Pouteria sapota</i> (Jacq.) H.E. Moore & Stearn), sugar apple ( <i>Annona squamosa</i> L.), cherry ( <i>Malpighia glabra</i> L.), star apple ( <i>Spondias cytherea</i> Sonn.) water melon ( <i>Citrullus lanatus</i> (Thunb.) Matsum. & Nakai) and star apple ( <i>Chrysophyllum cainito</i> L.).  |
| 2   | Vegetables                 | Tomato ( <i>Solanum lycopersicum</i> (L.) Lam), carrots ( <i>Daucus carota</i> L.), spinach ( <i>Spinacia oleracea</i> L.), pumpkin ( <i>Cucurbita pepo</i> L.), lettuce ( <i>Lactuca sativa</i> L.), cabbage ( <i>Brassica oleracea</i> var. <i>capitata</i> L.), onion ( <i>Allium cepa</i> L.), Green bean ( <i>Vigna unguiculata</i> [L.] Walp.), radish ( <i>Raphanus sativus</i> L), chard ( <i>Beta vulgaris</i> var. <i>cicla</i> .), okra ( <i>Abelmoschus esculentus</i> L.) and pepper ( <i>Cucumis sativus</i> L.).   |
| 3   | Tubers and roots           | Cassava ( <i>Manihot esculentum</i> Crantz.) and sweet potato ( <i>Ipomoea batata</i> (L.) Lam)   |
|     | Grains                     | Maize ( <i>Zea mays</i> L.) and bean ( <i>Phaseolus vulgaris</i> L.)  |
| 4   | Ornamentals and flowers    | Orchids of different genres ( <i>Cattleya</i> spp., <i>Phalaenopsis</i> spp., <i>Dendrobium</i> spp) Many genres (Lindl., Sw., etc.), filodendro ( <i>Philodendron</i> spp. Schott), clover ( <i>Trifolium repens</i> (white clover L. (Carl Linnaeus) <i>Aglaonema</i> ( <i>Aglaonema commutatum</i> . Schott), Dieffenbachia ( <i>Dieffenbachia seguine</i> (Jacq.) Schott. Fern ( <i>Nephrolepis exaltata</i> ), Roses ( <i>Rosa</i> spp.) L. (Carl Linnaeus), butterfly flower ( <i>Bauhinia</i> spp. o <i>Oxalis</i> spp. L. o Sm., Strip ( <i>Chlorophytum comosum</i> ) (Thunb.) Jacques, Mantos ( <i>Caladium bicolor</i> ) (Aiton) Vent., Begonias ( <i>Begonia</i> spp.) L., Violets ( <i>Saintpaulia ionantha</i> (african violet) H. Wendl.), Christ plant ( <i>Euphorbia milii</i> ) Des Moul., arecas ( <i>Dypsis lutescens</i> (areca palm) (H. Wendl.) Beentje & J. Dransf.) and Tagetos <i>Tagetes erecta</i> L (carnation, flower of the dead). |
| 5   | Medicinal and condimentary | Pepper ( <i>Capsicum annum</i> L.), leek ( <i>Allium porrum</i> L.), garlic ( <i>Allium sativum</i> L.), chives ( <i>Allium schoenoprasum</i> L.), coriander ( <i>Coriandrum sativum</i> L.), oregano ( <i>Origanum vulgare</i> L.), tilo ( <i>Dianthera pectoralis</i> (Jacq.) J.F.Gmel.), oyster plant ( <i>Tradescantia spathacea</i> Sw.), rosy periwinkle ( <i>Catharanthus roseus</i> (L.) G. Don, Anise ( <i>Pimpinella anisum</i> L) Mint ( <i>Mentha</i> L.), vervain ( <i>Verbena officinalis</i> L.), Holy reed ( <i>Costus spicatus</i> (Jacq) Sw. Rose.), Fly bush ( <i>Plectranthus neochilus</i> Schltr), Cardon ( <i>Euphorbia lactea</i> Haw), Holy grass ( <i>Piper auritum</i> Kunth.), Leopard lily ( <i>Belamcanda chinensis</i> (L.) DC.), Aloe Vera ( <i>Aloe vera</i> (L.) Burm.f.), sage ( <i>Salvia officinalis</i> L.) and Spearmint ( <i>Mentha spicata</i> L.)   |
| 6   | Timber                     | Gumbo-limbo tree ( <i>Pistacia lentiscus</i> L.) ( <i>it is also used as medicinals</i> )   |
| 7   | Animals                    | Hens ( <i>Gallus gallus domesticus</i> ) chickens, rams ( <i>Ovis orientalis aries</i> ) ducks ( <i>Anas platyrhynchos domesticus</i> ) pigs ( <i>Sus scrofa domesticus</i> )   |
| 8   | Others                     | Coffee ( <i>Coffea</i> sp.)   |

As demonstrated in the table above, there is a wide agricultural diversity, which is vitally important to recognize and promote biodiversity as an essential condition for the sustainability of the natural landscape and the ecosystems that comprise it. It is worth noting that family farming is not only the guardian of biodiversity in its productive system or agroecosystem, but also acts to sustain production and confront environmental and climate change, in addition to satisfying its sociocultural and economic needs (13). In Cuba, the need to build sovereign and sustainable local food systems has gradually gained ground.

Urban and suburban agriculture is essential to advance in food production and sustainable management, developing education and training, primarily directly for producers (14). Therefore, it is agreed that local food systems are becoming dynamic scenarios for integration and social inclusion, as they incorporate the sociocultural imagery of families, their traditions, and the networks of social relationships configured around individual or collective needs. All of the above, with the intention of reviving the country's economic, social, and productive development under current conditions (15), makes

it necessary to incorporate the idea of multiple land uses and the multifunctionality of agriculture.

In an initial intervention, it was observed that many people only had one or two plant species, and following the recommendations made, they began to transform their properties. Subsequently, monitoring efforts showed that they had already achieved crop diversity. This was a positive result, since increasing agricultural diversity is vitally important due to the benefits it brings to agroecosystems and to human food and consumption.

### Training needs and interest in local agricultural innovation and agroecology

The main training topics of interest were identified, primarily related to seed production and conservation, the use of bioproducts, and fruit tree management and production. Subsequently, in response to this demand, thematic workshops were held with specialists in the fields for direct advice, as shown in Photo 1.

**Photo 1.** Training in the productive spaces of Urban, Suburban and Family Agriculture of Zaragoza, San José de las Lajas, Mayabeque

## CONCLUSIONS

In the agricultural areas of the Zaragoza People's Council, plots of land predominate, and it was learned that those interested in food production lacked sufficient land. The diversity of existing crops was evident, highlighting the production of root vegetables, grains, vegetables, medicinal and spice plants, as well as backyard animals. The main training topics of interest were identified, which were related to seed production and conservation, the use of bioproducts, and the management and production of fruit trees.

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