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THE CONSERVATION OF FOODS, AN ALTERNATIVE FOR THE INVIGORATION OF THE ALIMENTARY SECURITY AT LOCAL LEVEL

La conservación de alimentos, una alternativa para el fortalecimiento de la seguridad alimentaria a nivel local

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ABSTRACT. The work was developed in four Popular Council: PC Jibacoa, Santa Cruz del Norte municipality, county Mayabeque, PC La Moza, Manicaragua and PC Taguayabón, Camajuaní in Villa Clara and PC las 40, Urban Noris in Holguín with the objective of promoting the development of farm garden to increase the diversity in the consumption starting from the production and conservation of foods in a local context. The population's real demands were identified through informal interviews and the realization of a historical-contextual analysis. They were defined indicators that were taken into account to design the work strategy and they were carried out five training shops for Popular Council on development of farm garden, elaboration of pulps and juices, mixed preserves, dry condiments, wines and vinegars. Nine farm garden were fomented and a wide range of products was reached that they were not conserve d neither they consumed previously. The formed innovation groups, were able to develop experiences of conservation of foods that influenced favorably in the development of the community, becoming a strength to keep in mind to improve the quality of the feeding and before the scarcer of products in the market. The sale of fresh and conserved products began to generate revenues in different spaces created for the commercialization.

Key words: farm garden, innovation groups, training

RESUMEN. El trabajo se desarrolló en cuatro Consejos Populares: CP Jibacoa, municipio Santa Cruz del Norte, provincia Mayabeque, CP La Moza, Manicaragua y CP Taguayabón, Camajuaní en Villa Clara y CP Las 40, Urbano Noris en Holguín, con el objetivo de promover el fomento de huertos familiares para aumentar la diversidad en el consumo a partir de la producción y conservación de alimentos en un contexto local. Las demandas reales de la población se identificaron a través de entrevistas informales y la realización de un análisis histórico-contextual. Se definieron indicadores que fueron tomados en cuenta para diseñar la estrategia de trabajo y se realizaron cinco talleres de capacitación por Consejo Popular sobre desarrollo de huertos, procesamientos de pulpas y jugos, conservas mixtas, condimentos secos, vinos y vinagres. Se fomentaron nueve huertos familiares y se alcanzó una amplia gama de productos que no se conservaban ni consumían con anterioridad. Los grupos de innovación formados, lograron desarrollar experiencias de conservación de alimentos que incidieron favorablemente en el desarrollo de la comunidad, convirtiéndose en una fortaleza a tener en cuenta para mejorar la calidad de la alimentación y ante la escases de productos en el mercado. La venta de productos frescos y conservados comenzó a generar ingresos en diferentes espacios creados para la comercialización.

Palabras clave: capacitación, huertos familiares, grupos de innovación

INTRODUCTION

The supply of fresh vegetables throughout the year, together with the other agricultural products of these species that allow to deliver at least 300 g per capita of daily vegetables in the family table, has been one of the goals of the organoponics production and in the variant of intensive orchards (1).

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With the generalization of the organoponics in the country and from the development achieved by them since the beginning of their exploitation, the technology of crop management used in the organoponics was extended in the mid-1990's to intensive gardens. This modality of horticultural cultivation is among the most productive and spread throughout the national territory (1), reaching 1 260 000 t ha^{-1} of vegetables at the end of 2014[A].

The production in yards and home gardens also allows to satisfy the needs related to food security at the domestic level with the small scale production of vegetables, plants for condiments or medicinal, as well as other complementary productions, achieving a better nutritional balance in the diet.

Family orchrds are important and play multiple roles at family, community and commercial levels (2), and it represents a means where the family can generate savings or increase its economic resources by investing in value-in-use products transformed into goods with exchange value. Among the traditions of Cuban households (3, 4) whether in rural or urban areas, it is the custom of families to have a small orchard or garden.

A model of local artisan development, alternative to the food industry, more sustainable for small Cuban producers and families, was introduced by the Community Project for Food Conservation (5). Where it is a question of generalizing within the Cuban family the methods that allow the preservation of food, condiments and medicinal plants, as well as in the subprogram of the small urban and sub-urban agriculture agroindustry[B], allows the use of by-products and processing of Local seasonal surpluses, it promotes the local production of durable foods, thus contributing to raise the quality of the popular food and also give value added to different agricultural productions.

The conservation of food by artisanal methods has enormous advantages, both for the families in their houses and for the small and medium productions in craft centers, especially when natural, simple, scarce resources and low inputs are used (5), and contributes to food security as a development of the local agro-industry (2).

From the background this work was developed with the objective of promoting the development of home orchads to increase the diversity in consumption from the production and conservation of food in a local context.

MATERIALS AND METHODS

The work was carried out in four Popular Councils: PC "Jibacoa", Santa Cruz del Norte municipality, Mayabeque province, PC "La Moza", Manicaragua and PC "Taguayabón", Camajuaní both in Villa Clara and PC Las 40, Urbano Noris, Holguín.

In each People's Council the work consisted in sensitizing, training and creating groups of innovation formed by women and men to initiate, motivate and develop pilot experiences of food conservation in order to have a positive impact on the family and the community, both for the improvement of Diet in diversification and quality as in the generation of economic benefits through the production of new products for the local market.

The first actions took place in the middle of 2009 and they were related to the incorporation of the Local Governments, National Association of Small Farmers, Communist Party of Cuba and Federation of Cuban Women.

Informal interviews with 50 consumers by popular advice and a historical-contextual analysis allowed identifying real demands of the population related to local tastes, customs and traditions to move from the known to the diversification and need for food conservation as a strength for consumption family and community.

Subsequent to the diagnosis, workshops were carried out for the identification and recognition of local actors where indicators were defined to measure and monitor changes and to evaluate possible future impacts once the research work [C, D] (Table I).

Ten innovation groups were formed and five workshops were held by the People's Council for training on orchard development, processing of pulps and juices, mixed preserves, dry seasonings and wines and vinegars, using the many known conservation techniques or methods (5).

The data were weighted on a scale of 1-5, in two moments: at the beginning of the actions and at the end (6).

The data were analyzed using the SPSS (7) statistical processor, using the nonparametric "T" test of paired data.

With the groups identified, a series of workshops was started to exchange experiences in the work scenarios involved. Subsequently, participatory monitoring workshops were held where those involved were self-assessed and progress and limitations were recognized.

[A] Ramírez, A. *Informe Grupo Nacional de Agricultura Urbana y Suburbana*. 2014.

[B] INIFAT. *Lineamientos de la agricultura urbana y sub urbana para el año 2014*. 2013, 133 p.

[C] Lores, A. *Propuesta metodológica para el desarrollo sostenible de los agroecosistemas. Contribución al estudio de la agrobiodiversidad. Estudio de caso: Comunidad «Zaragoza», La Habana, Cuba*. Tesis de Doctorado, Instituto Nacional de Ciencias Agrícolas, 2009, La Habana, Cuba, 172 p.

[D] Pérez, T. *Propuesta metodológica para el análisis de la seguridad alimentaria a nivel local en Cuba. Experiencia en el municipio San José de las Lajas*. Tesis de Doctorado, Universidad Agraria de La Habana, 2010, La Habana, Cuba, 140 p.

Table I. Dimension and indicators identified

Dimension	Indicator
Social	Family Involvement Community integration
Productive	Methods of conservation
Economic environmental	Income generation Increased horticultural diversity

RESULTADS AND DISCUSSION

As a result of the training workshops, 90 % of the innovation groups were encouraged to develop home orchard as a safe source of some products, especially vegetables and condiments for conservation and fresh consumption of food for the family. Total of nine family gardens in the four Popular Councils, 3 in Jibacoa, 2 in La Moza, 2 in Taguayabón and 2 in Las 40, in patios and spaces adjacent to the houses in, following the same principle of rescue of idle facilities for the production of leafy vegetables and 12 short cycles for sale and consumption in the community.

According to the results of the diagnosis, 85 % of those involved in the work had prior experience in preserving some food, mainly tomato and mango pulp; being the most used method pasteurization, besides the use of sugar for jams and fruit jellies and vinegar for pickings of some vegetables (5). The training workshops carried out allowed a greater range of products to be achieved which were not produced, preserved or consumed in advance (Table II).

As part of the strategy for the dissemination of results and products, at the municipal level eight Festivals of Local Innovation (8) were held as an effective platform for the presentation and market testing of new productions linked to food preservation. In each of these festivals and with the authorizations granted by the competent bodies, fresh and preserved products were marketed, as well as market tests in each territory, based on the possibility of interacting directly with consumers.

Monitoring and evaluation was carried out to measure the progress of the actions and activities to be carried out to maintain and improve the results obtained.

Table II. Diversity of preserved products incorporated in the four Popular Councils

Products	2009	2011
Pulps and juices	Tomato, pepper, mango	Tomato, capsicum, mango, lemon, sour orange and sweet, tamarind, guava.
Mixed conserved		Green tomato, habichuela, cucumber, pepper, capsicum, carrot, beet, cabbage, okra.
Dry condiments		Rosemary, basil, oregano, turmeric, annato, capsicum, ginger, garlic, fennel.
Wines and Vinegar	Pineapple, rice, grape	Pineapple, rice, grape, carambola, jamaican flower, , hibiscus, banana, sugarcane, cherry.

In order to follow up on the actions carried out, participatory monitoring workshops were held in each locality in which those involved were self-evaluated and acknowledged progress and limitations of the work developed.

Taking into account different methods of monitoring and evaluation (9), whether for urban or rural contexts, with conventional or participatory approaches that have been adapted according to each case study, these workshops allowed to incorporate leading producers and local decision makers as part of the coordinating group and refocusing the work according to the specific needs of each work context.

In the comparative analysis of the weighting of the impact indicators in two moments of the execution of the actions, significant differences were found in all popular councils except for the income generation indicators in La Moza, and the family in Las 40.

Figures 1, 2, 3 and 4 show the values of each indicator on the weighted scale according to the results after two and a half years of work in the different localities.

As in other experiences (10-12), one of the premises of this work was the inclusion and family participation, mainly of women and young people, in food processing and preservation. At this stage, the leadership of nine local facilitators, including six women, was recognized. It is also important to note that six people under the age of 30 were involved, which is a positive balance if we take into account the need to maintain the continuity of processes for local community strengthening.

Although the indicator related to the family dimension did not show differences in the Popular Council "Las 40", the values show that the family approach used to

[E] Zayas, C.; Rojas, H. y Cárdenas, R. "Proyección comunitaria para el desarrollo productivo y docente de la agricultura urbana en el consejo popular Argelia Victoria". En: *VIII Encuentro Internacional de Agricultura Orgánica y Sostenible*, Ciudad de La Habana, Cuba, 2010.

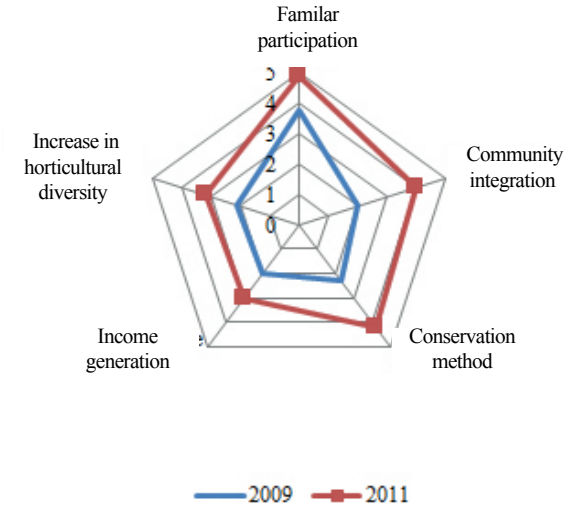

Figure 1. Analysis of the dimensions evaluated in PC "Jibacoa"

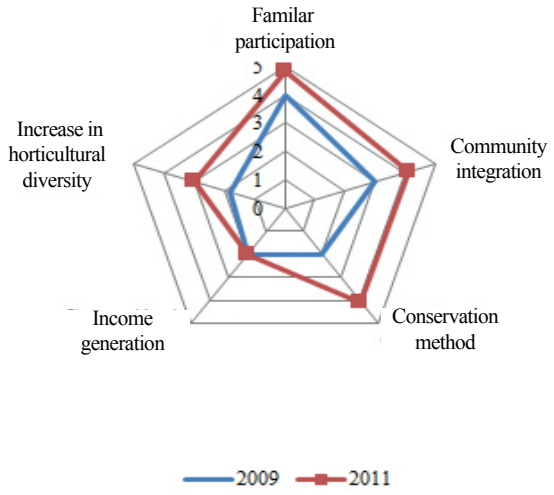

Figure 2. Analysis of the dimensions evaluated in PC "La Moza"

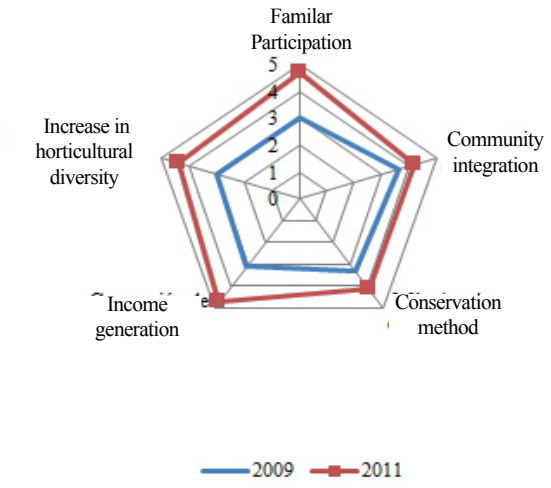

Figure 3. Analysis of the dimensions evaluated in PC "Taguayabón"

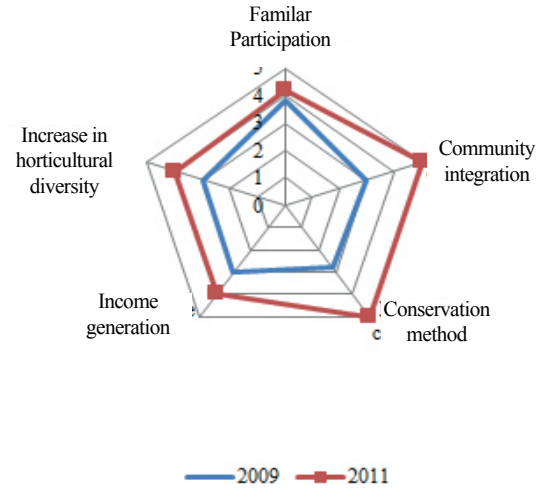

Figure 4. Analysis of the dimensions evaluated in PC "Las 40"

develop activities in the community is good, and as in other works[F], a refocusing of tasks at the family level and initiatives were promoted where all members, including children, play their part in the productive process.

In general, it was possible to diversify the conservation methods, highlighting dehydration and pickling (Figure 5). Similar results were obtained in works developed in communities from other localities[G].

Incorporating new species into the production systems was a fundamental element for the development of this work, taking into account the

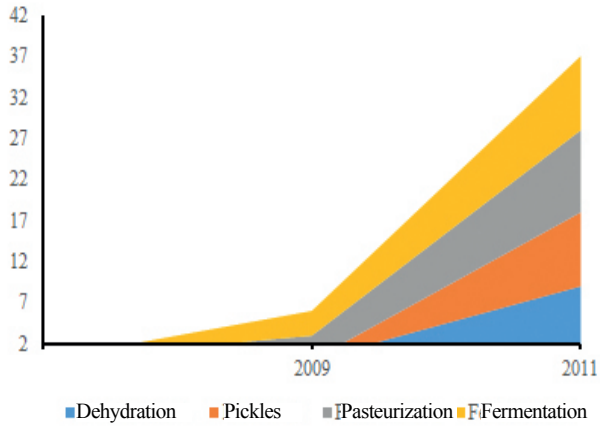

Figure 5. Food Conservation Methods

[F] Gerardo, J. R. y Rivero, R. "Programa espacios productivos familiares bajo prácticas agroecológicas comunidad de San Diego - municipio Petit estado Falcón – Venezuela". En: *VIII Encuentro Internacional de Agricultura Orgánica y Sostenible*, Ciudad de La Habana, Cuba, 2010.

need to supply fresh products for conservation. Horticultural diversity was increased mainly by the established exchange between producers and was in total agreement with the principles promoted by the National Group of Urban and Suburban Agriculture (1); however, other species of grains and tubers used were diversified through participatory plant breeding (13). In the localities of La Lima and Jibacoa, initially the availability of vegetables was limited. La Lima was a town that based its economy entirely on agriculture, mainly tobacco production, livestock, coffee and forestry and the second was an area of sugarcane and livestock tradition that although already planted various crops such as banana, sweet potatoes and cassava. It was very convenient to incorporate new horticultural species to diversify the variety of food available.

With the increase of agricultural diversity in general and the new methods of conservation used, income generation improved in three of the four work scenarios. The products were marketed through popular fairs, cooperatives according to their corporate purpose and in spaces created for this purpose (8). Particularly in La Moza, the differences were not significant because, as in other studies (14), in most cases the productions were destined for family consumption, without any impact on the local market. This could be due to its location away from the urban center, however, family farming is being developed as a new mode of production already developed in other municipalities in the country (15). The creation of permanent spaces for the commercialization of these products remains a challenge for producers, institutions and decision makers involved in this process.

As in other successful experiences (16), this work had a positive impact on the community, achieving a high degree of participation and interest of the inhabitants in the spaces created for the presentation of the products. Providing in all cases an exchange of knowledge related to aspects related to production in home gardens, methods of conservation, food and nutrition. Allowing the dissemination of knowledge and strengthening the capacities created by appropriating new forms of conservation and management of horticultural crops, to achieve a diversified production of food that contribute to improving food availability and diet.

Although the food needs of families and the community cannot be fully guaranteed, the diet was greatly improved; mainly the quality and variety of food, as there are fresh sources of vitamins and minerals produced under agroecological practices.

CONCLUSIONS

- It was possible to define indicators that allowed assessing the strengthening of food security at the local level based on the analysis of the social, productive, economic and environmental dimensions.
- The trained innovation groups were able to develop food conservation experiences that favored community development.
- Food preservation became strength to be taken into account in order to improve the quality of food and to the lack of products in the market and limitations of internal and external imports.
- Revenues were generated for sales of fresh and preserved products in different spaces created for commercialization.

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