

Experience of good practices in the cooperative sector

## Territorial value chain in the "Tierra Brava" farm as a contribution to food security

### Cadena de valor territorial en la Finca "Tierra Brava" como contribución a la seguridad alimentaria

### A cadeia de valor territorial na fazenda "Tierra Brava" como uma contribuição para a segurança alimentar



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## ABSTRACT

The management of food and nutritional security is one of the priority elements within the government agenda in Cuba, as indicated in the National Economic and Social Development Plan until 2030 and Law 148/2022 on Food Sovereignty and Food and Nutritional Security. This requires multi-actoral, multi-sectoral, interdisciplinary participation, led by the government. In this endeavor, it is essential to strengthen the capacities of local actors to manage, in a context of decentralization, the set of public policies, strategies, programs and projects that give content to the management of local development. In this sense, the research is aimed at designing a territorial value chain of agroecological products in the "Tierra Brava" farm in the municipality of Los Palacios, which contributes to municipal self-sufficiency by increasing the supply of canned fruits, vegetables and condiments, on the basis of public-private articulation, linkage in terms of closing the production cycle, knowledge management and innovation and technology transfer. The theoretical methods used

were historical-logical, systemic and hypothetical-deductive, and as empirical ones, observation and the documentary analysis. From their implementation, impacts were achieved related to the increase of agricultural productive capacities, increase in the yield of their plots and the diversity of products, the use of renewable energy sources, the application of agroecological practices, generation of employment for women and young people, better conditions and capacities of a point of sale of fresh processed and frozen products.

**Keywords:** territorial value chain; food production; food and nutritional security and sovereignty.

## RESUMEN

La gestión de la seguridad alimentaria y nutricional es uno de los elementos prioritarios dentro de la agenda de gobierno en Cuba, según se indica en el Plan Nacional de Desarrollo Económico y Social hasta 2030 y la Ley 148/2022 de Soberanía Alimentaria y Seguridad Alimentaria y Nutricional. Esta precisa de la participación multiactoral, multisectorial, interdisciplinaria, liderada por el gobierno. En este empeño, resulta esencial fortalecer las capacidades de los actores locales para gestionar, en un contexto de descentralización, el conjunto de políticas públicas, estrategias, programas y proyectos que dan contenido a la gestión del desarrollo local. En este sentido, la investigación va encaminada a diseñar una cadena de valor territorial de productos agroecológicos en la Finca "Tierra Brava" en el municipio Los Palacios, que contribuya al autoabastecimiento municipal a partir del incremento de la oferta de conservas de frutas, vegetales y condimentos, sobre la base de la articulación público-privada, el encadenamiento en función del cierre de ciclo productivo, la gestión del conocimiento y la innovación y la transferencia tecnológica. Los métodos teóricos utilizados fueron el histórico-lógico, sistémico e hipotético-deductivo, y como empíricos, la observación y el análisis documental. A partir de su implementación, se lograron impactos relacionados con el incremento de las capacidades productivas agrícolas, aumento del rendimiento de sus parcelas y de la diversidad de productos, el uso de fuentes renovables de energía, la aplicación de prácticas agroecológicas, generación de empleo para mujeres y jóvenes, mejores condiciones y capacidades de un punto de venta de productos frescos procesados y congelados.

**Palabras clave:** cadena de valor territorial; producción de alimentos; seguridad y soberanía alimentaria y nutricional.

## RESUMO

A gestão da segurança alimentar e nutricional é um dos elementos prioritários da agenda governamental em Cuba, tal como indicado no Plano Nacional de Desenvolvimento Económico e Social até 2030 e na Lei 148/2022 sobre Soberania Alimentar e Segurança Alimentar e Nutricional. Isto requer uma participação multi-atorial, multisetorial e interdisciplinar, liderada pelo governo. Neste esforço, é essencial reforçar as capacidades dos atores locais para gerir, num contexto de descentralização, o conjunto de políticas, estratégias, programas e projetos públicos que dão conteúdo à gestão do desenvolvimento local. Neste sentido, a investigação visa conceber uma cadeia de valor territorial de produtos agroecológicos na fazenda "Tierra Brava" no município de Los Palacios, que contribui para a autossuficiência municipal ao aumentar a oferta de conservas de fruta, vegetais e condimentos, com base na articulação público-privada, ligações em termos de encerramento do ciclo de produção, gestão do conhecimento e inovação e transferência de tecnologia. Os métodos utilizados foram históricos-lógicos, sistémicos e hipotético-dedutivos, e os métodos empíricos utilizados foram a observação e a análise documental. A partir da sua implementação, foram alcançados impactos relacionados com o aumento das capacidades produtivas agrícolas, aumento do rendimento das suas parcelas e da diversidade de produtos, utilização de fontes de energia renováveis, aplicação de práticas agroecológicas, geração de emprego para mulheres e jovens, melhores condições e capacidades de um ponto de venda de produtos frescos transformados e congelados.

**Palavras-chave:** cadeia de valor territorial; produção alimentar; segurança e soberania alimentar e nutricional.

## INTRODUCTION

The value chain implies a need for interrelation of activities and strategic collaboration among the various stakeholders involved, such as: producers, enterprises, governments and civil society for the mutual benefit of the participants and with the objective of meeting the needs of the demand for a specific product; in addition, it must be environmentally sustainable. To generate these alliances, it is necessary to address innovative solutions from the regional level to find relevant relationships and opportunities for change.

This brings benefits to the parties involved that, on their own, would not have been achieved, which generates a strategic panorama that demands efforts to add value and control costs. Therefore, it is necessary to define which activities have the greatest value for customers, enhancing them to generate income, reduce costs and eliminate activities that do not add value. On the other hand, the competitiveness of the product-element involved in the last link of the chain will depend on the efficiency of all the activities that are interwoven throughout the chain and in all its phases.

Value chains for the agri-food sector are characterized by greater involvement in social aspects such as: selling a new product or introducing an existing product to a new market, ensuring food safety with high quality products, maintaining or increasing presence in a market amid growing domestic or external competition, or responding to new government regulations that affect the product process (Peña et al., 2008).

From the point of view of Food and Nutrition Security (Fns), the value chain can be approached from various perspectives, taking into account its contribution to income generation as an element of economic accessibility, through the creation of new jobs, physical accessibility and the availability it fosters from the local space and, on the other hand, its contribution to improving nutrition, based on the nutritional problems of the target populations and the demand for certain foods, as well as the opportunities to add nutritional value (and/or minimize food and nutrient loss) in each link of the value chain, its contribution to improving nutrition, starting from the nutritional problems of target populations and the demand for certain foods, as well as the opportunities to add nutritional value (and/or minimize the loss of food and nutrients) in each link of the chain, thus improving the affordability, quality and acceptability of nutritious food (Fao, 2017).

Among the most recent actions that the country has taken to guarantee Fns are those aimed at implementing the National Plan for Food Sovereignty and Nutritional Education, the approval of Law 148/2022 on Food Sovereignty and Food and Nutritional Security by the National Assembly of People's Power (2022), which obeys what is expressed in the current Constitution of the Republic of Cuba (2019) regarding the right to healthy and adequate food of the population (Articles 77 and 78). This legal norm orders the processes of production, transformation and commercialization of food until its consumption and for such purposes establishes the measures and strategies to make the most of the municipalities' own resources and obtain safe, quality, nutritious, balanced and culturally accepted food (Minag, 2020). This has led to the structural and content updating of the Municipal

Development Strategy and, finally, the definition of Local Development Projects aimed at food production, processing and marketing (Ramos Crespo & González Pérez, 2019).

In this sense, the strategic role of the cooperative sector in Cuba and its linkage through productive chains with other forms of state and non-state management is also recognized, in order to increase the added value of local production, promote exports, substitute imports and contribute to food sovereignty and nutritional education (Labrador Machín et al., 2020).

In line with this process, in the municipality of Los Palacios, as in the rest of the province of Pinar del Río, the implementation of the approved Municipal Development Strategy is based on a work system implemented by the Municipal Assembly of People's Power, which focuses on the development of a Public Administration, based on the Government-University-Enterprise Network-Society alliance, which defines its essence in the management of knowledge and innovation as the principle of its operation.

The "Tierra Brava" farm belonging to the "Niceto Pérez" Credit and Services Cooperative, located in the municipality of Los Palacios in Pinar del Río, is recognized among the 8 best experiences in the world in resilience to drought and climate change, a category that stimulates the efforts of this collective with a family organization. In it, it is involved several international and national projects such as: Articulated Platform for Integral Territorial Development (Padit in Spanish), Capacity building for planning, decision-making and regulatory systems, awareness raising and sustainable land management in severely degraded ecosystems (OP-15), Environmental Information System for Decision Making (Infogeo in Spanish), Initiative for the financing of biodiversity (Biofin in Spanish), among others, and it is also involved in agriculture 4.0 or precision agriculture. It is declared by the National Association of Small Farmers as an agroecological farm, being a reference in Cuba. It operates as a teaching unit of the "Ángel Calletano Ramírez" Polytechnic Institute.

In this space, linkages are generated between several producers of the locality and the rest of the municipality, as well as state entities of production and services and with entities of Science, Technology and Innovation and the local government, however, these relationships are not established in a systematic way, they do not take advantage of the potential and there is insufficient inter-actor, inter-territorial and multilevel articulation.

This favors the design and implementation of a Territorial Value Chain (CVT in Spanish), which expresses the real articulation of actors and alliances with academia and other Science, Technology

and Innovation institutions in terms of a common objective: its contribution to municipal self-sufficiency and commercialization in Free Convertible Currency (MLC in Spanish) (exports and domestic sales) from the closing of local production cycles, public-private articulation and technology transfer.

For the implementation of the CVT, several sources of financing are complemented: the Territorial Contribution for Development Account (Local Government Trust fund), the private producer's Bank Credit, other associated producers' own funds, the Credit and Services Cooperative (CCS in Spanish) Funds and International Cooperation funds (Capacity Building for Planning, Decision Making and Regulatory Systems, Awareness and Sustainable Land Management in Severely Degraded Ecosystems (OP-15) and Articulated Platform for Integral Territorial Development-United Nations Development Program).

The result presented here is aimed at designing a territorial value chain of agroecological products in the "Tierra Brava" farm in the municipality of Los Palacios, which contributes to municipal self-sufficiency by increasing the supply of canned fruits, vegetables and condiments, based on public-private articulation, linkage in terms of closing the production cycle, knowledge management and innovation and technology transfer.

## **MATERIALS AND METHODS**

The following methods and techniques were applied in the development of the research:

There were used theoretical methods, such as the historical-logical method, to assess the background of the territorial value chain and its link to food security, which application made it possible to recognize national and international experiences related to the topic and analyze their contributions, as well as the systemic method that made it possible to characterize the object of the research by specifying the interrelationship between the territorial value chain and its contribution to food security.

Regarding the empirical methods, it is started from the scientific observation, visualizing the relationship between the "Tierra Brava" farm, the producers of the locality and the rest of the municipality, the role of the board of directors, the partners, actors of different agencies and organizations linked to the cooperatives: State entities of production and services, to Entities of Science, Technology and Innovation of the municipality, to the local Government and the final

consumers, through the development of meetings with advisors and specialists and questionnaires to reaffirm the importance of the chaining from a participatory vision to assume the national plan of food sovereignty and nutritional education of our country. Through documentary analysis, scientific articles, books, resolutions and documents related to technologies for developing a territorial value chain and its relationship with food security were consulted.

The procedures used were analysis and synthesis, scientific abstraction, induction-deduction and individual and group interview techniques, predominantly documentary analysis, as well as participatory action research and group work. The proposal was constructed in a participatory and collegial manner in the group created for this purpose and was subsequently submitted for final consideration and approval.

## RESULTS AND DISCUSSION

### Methodology

For the development of the methodology, the contributions made by various authors such as Antúnez Saiz and Ferrer Castañedo (2021), Arias Gilart et al. (2021), Dávila Hernández et al. (2019) and Nutz and Sievers (2016) were taken into account. The proposal includes the following stages:

#### Phase 1. Preparatory

**Step 1.1** Actors selection

**Step 1.2** Actors awareness and training

**Step 1.3** Formation of a multidisciplinary team representing the various links in the chain (provision of services, supply of inputs, primary production, transportation of raw materials, processing, transportation, processed products, marketing and consumption).

#### Phase 2. Diagnosis and analysis of the territorial value chain

**Step 2.1** Selection of the chain, products to be analyzed

**Step 2.2** Design the structure of the chain through collective inclusion and participation (Scope, links and stakeholders).

**Activity 2.2.1** Design of horizontal relationships

**Activity 2.2.2** Design of vertical horizontal relations

**Step 2.3** Design of instruments, data collection and analysis of the external context (background, environment and market) and internal context (analysis of actors, analysis of processes and flows, economic-financial, environmental, social and political-institutional analysis) of the chain.

**Phase 3.** Implementation of the territorial value chain

**Step 3.1** Application of the system of horizontal and vertical ratios

**Phase 4.** Monitoring and measurement of results

**Practical application**

This methodology adopted a systemic approach; in addition to incorporating the links in the chain, it included the various public and private actors that regulate or support their productive activities (government agencies, universities, service providers and research centers, among others). In addition, participation was included as a basic component, dialogue between public and private actors, who were convened at dialogue tables to validate the information presented in the diagnosis and in the design of the proposal. This allowed the design of innovative proposals in the formulation of strategies, facilitated the formulation of agreements and promoted greater transparency in decision-making.

One element that was taken into account was the integrity of the wholesomeness of food and food raw materials, applicable at the primary production stages, including the control of standards that ensured fair trade practices and protected the interests and information of consumers.

A market demand study was also conducted in the context of the regional market, including market composition and size, quality product segments, types of buyers, buyer preferences, product differentiation and market prices. Effective product positioning strategies were identified, given the variety and quality of the products offered by the farm.



In the last phase, progress was reviewed in four areas: inputs, outputs, outcomes and impact at different levels, allowing for monitoring and adaptation to difficulties and challenges in a constantly changing environment.

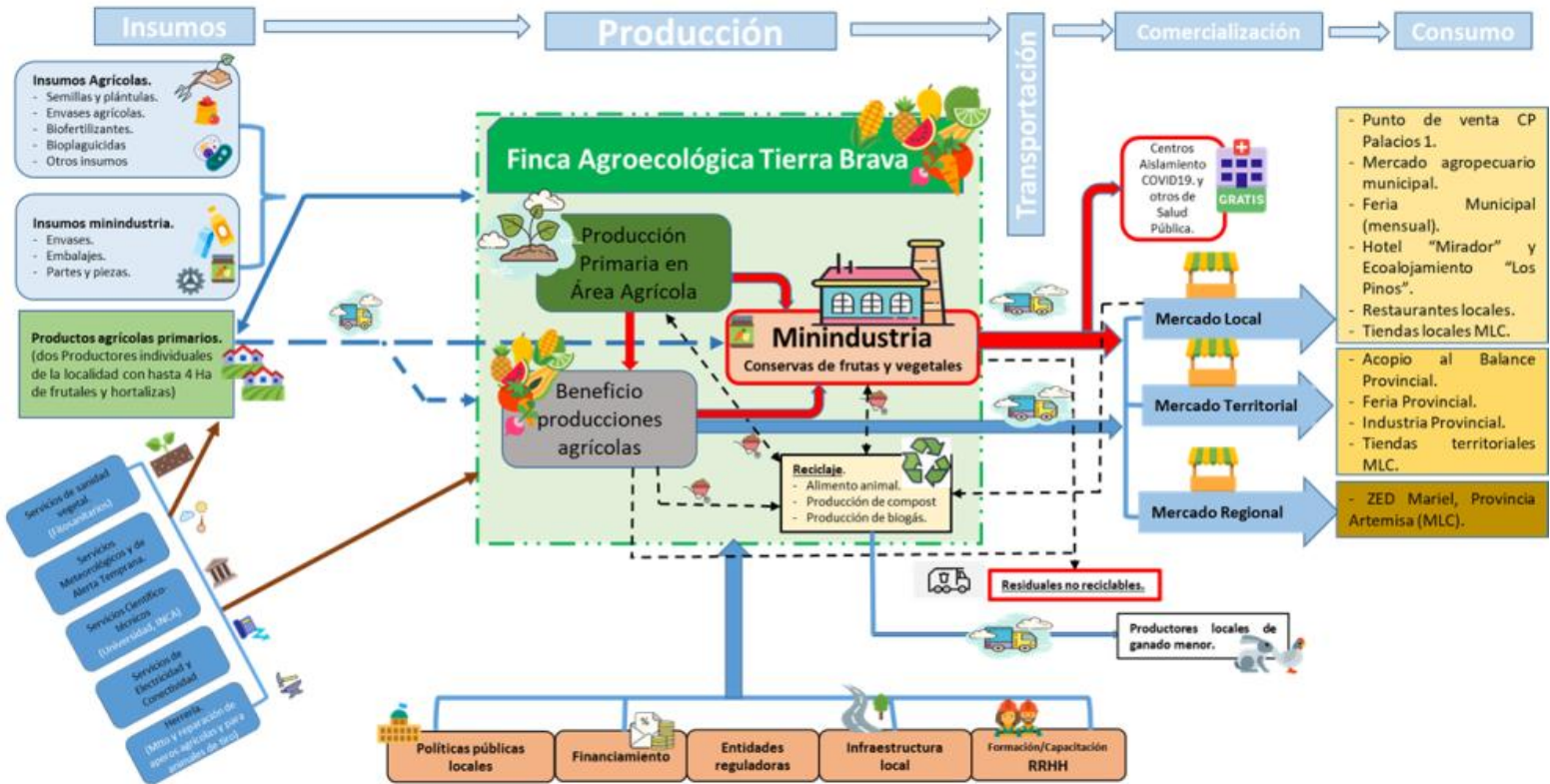
In this context, a CVT was designed and implemented as shown in Figure 1, involving agricultural producers of the "Paso Quemado" Popular Council of the municipality of Los Palacios, province of Pinar del Río, Cuba, in which core or central link is located the "Tierra Brava" Farm, which, in addition to agricultural production (primary level), had capacities for the processing and transformation (secondary level) of fruits, vegetables and condiments.

In a horizontal view, four fundamental links were identified in this CVT, with the following relevant information:

1. Primary link (services and inputs): Other service providers and suppliers included Science Technology and Innovation entities that ensured the implementation of specific agroecological practices, soil studies, phytosanitary care and seed certification, among which are related the Scientific Technological Base Unit (UCTB in Spanish) of the National Institute of Agricultural Sciences in the municipality of Los Palacios, the UCTB Soil Institute in Pinar del Río, the Seed Production and Marketing Company of Pinar del Río, the technical area of the Agricultural and livestock Enterprise CUBAQUIVIR in the municipality of Los Palacios and the Plant Health Directorate of the Delegation of the Ministry of Agriculture in Pinar del Río. Two local agricultural producers, owners of small farms producing fruits and vegetables adjacent to the "Tierra Brava" farm, with a wide experience accumulated in productive tradition in these crops and who have adequate seeds to obtain high quality fresh products, were integrated. In this part of the chain, suppliers of basic services such as electricity by the Organización Básica Eléctrica of Pinar del Río and connectivity by the Telecommunications Company, water supply by the Empresa Agropecuaria Militar of Los Palacios and agricultural inputs by the Empresa de Suministros Agropecuarios de Pinar del Río were associated with this part of the chain.
2. Secondary link (production, the core of the CVT): The "Tierra Brava" farm has a long tradition in the production of high quality fruits and vegetables and agricultural yields, which makes it a reference and local leader, attracting small neighboring farmers (mainly from neighboring farms), has a basic infrastructure for the processing and transformation (mini-industry) of agricultural production, generating a wide variety of products in high demand in local, territorial and regional markets. This farm has an area of 22 hectares, managed in the form

of free usufruct. The main crops are: mango, soursop, guava, tamarind, carambola, anon, cucumber and corn. For family consumption, an area of approximately 0.5 hectares was set aside for growing viands and vegetables. As part of the application of silvopastoral management techniques, there is a 35-head sheep flock.

3. Tertiary link (marketing and consumption): Three levels of market interested in the productions were recognized: the local, composed of physical-organizational-operational infrastructures at the scale of the municipality, which contributed directly to municipal self-sufficiency and are governed by the policies implemented by the local Public Administration, contributed with inputs to the local tourism structures, health institutions and others in the locality, among them are: Los Palacios 1 point of sale, Municipal Agricultural Market, Municipal Fair (monthly), Hotel Mirador, Local Development Project Recreational Center Parque La Güira and Ecolodge Los Pinos, Local Restaurants and Local Stores in MLC; the territorial, which refers to the provincial scale, with which CVT producers have contractual commitments for their contribution to the food balances at that scale, such as: Stockpiling to Provincial Balance, Provincial Fair, Provincial Industry and Territorial Stores MLC and finally the regional market, in this case focused on the Special Development Zone Mariel of Artemisa province, in which a sufficient real demand was manifested for a part of the productions with the objective of capturing foreign currency for the technological sustainability of the nucleus of the chain.



**Fig. 1** - Map of the territorial value chain in the "Tierra Brava" farm

Source: Prepared by the authors

The aforementioned value chain has led to the organization of dependent and related activities that are necessary to provide a safe and healthy product, from the production stage to consumption. It made it possible to create value not only for customers and stakeholders, but also to minimize the negative impact on the environment.

### Economic, social and environmental benefits

- Identified and diagnosed a Territorial Value Chain, which core is the "Tierra Brava" Farm, which articulates two local producers (members of the Niceto Pérez CCS) and eventually others from the rest of the municipality, state production and service entities, Science, Technology and Innovation Entities of the municipality, the local government and final consumers.

- Increased the agricultural production capacity of the "Tierra Brava" farm to achieve an annual production of 341.83 tons, which represents an increase of 136% over the 250 tons obtained previously as an annual average.
- Installed the technological equipment for a mini-industry for the processing of fruits, vegetables and condiments, with a capacity of up to 125 tons per year.
- 18 new jobs created; of these, 8 are women and 10 are young people.
- Increased the assortment of products of the fruit, vegetable and condiment processing mini-industry to a total of 25 products (Fresh processed: mango, soursop, tamarind, carambola, anon, guava, yucca, pumpkin, baby corn, cucumber. Frozen processed: mango slices, mango pulp, soursop pulp, carambola pulp, tamarind pulp, cabbage pickle, cucumber pickle, mixed pickle, vinaigrette, dry wine, vinegar and dry seasonings (turmeric, ginger, oregano, basil).
- Delivered at least 80 tons per year of preserves and other fruit, vegetable and condiment-based products for marketing in the municipality.
- Improved the conditions and capacities of a point of sale of fresh processed and frozen products in the "Palacios Norte" Popular Council, with an impact on an estimated population of 8,000 inhabitants. The premises were rehabilitated and equipment was installed for refrigeration (freezing and conservation), weighing and for the sale of natural juices.
- The production of two farms belonging to the CCS "Niceto Pérez" was boosted as a result of their incorporation to the CVT "Tierra Brava" Farm. These farms incorporated idle areas (total 4 hectares) to vegetable production (cucumber, tomato and pumpkin).
- Increased the average salary of farm workers by 50%. Benefiting 16 direct and 4 indirect workers on a permanent basis and about 15 temporary farm workers according to seasonal agricultural campaigns.
- Benefited 4 hectares with drip irrigation for permanent fruit crops and another 9 hectares with a rotating irrigation system.
- Installed a water pumping system with photovoltaic energy to irrigate the entire area of the farm.
- Of the 22 hectares of total farm area, 18 hectares (82%) are managed under precision agriculture and silvopastoralism with small livestock.
- Pollination is promoted by natural agents (birds and bees) and alternated with scientific methods of artificial pollination.

- Specific clones of seedlings are used depending on the soil characteristics in the different areas (lots) of the farm, considering the results of periodic soil studies and statistics on yield levels, pest and disease resistance and water demand.
- Monthly donations are made to children with chronic non-communicable diseases in the territory, whose health condition requires the consumption of fresh fruit. Approximately 300 kilograms of fruit are donated monthly, depending on the season of the year and the seasonal nature of these products (mainly mango, guava and banana).

The coordination among the actors integrated in the "Tierra Brava" CVT promoted its own development as a virtuous circle of interrelation. The mini-industry's own capacity to generate new products and assortments demands common actions in terms of the development of new agricultural production and, in turn, the incorporation of new agricultural areas and the introduction of new crops generate the need for the development and diversification of mini-industry products.

## REFERENCES

Antúnez Saiz, V. I., & Ferrer Castañedo, M. (2021). Metodología para el análisis de cadenas productivas en Cuba: El caso de Agrocadenas como proyecto innovador. *Estudios del Desarrollo Social: Cuba y América Latina*, 9(2), 33-49.

<http://www.revflacso.uh.cu/index.php/EDS/article/view/558>

Arias Gilart, M., González Stable, A., & Baños Guerra, Z. (2021). Cadenas de valor en la gestión municipal. *Temas*, (104-105), 59-63. <http://temas.cult.cu/articulos-academicos/cadenas-de-valor-en-la-gestion-municipal/>

Asamblea Nacional del Poder Popular. (2019). *Constitución de la República de Cuba*. Gaceta Oficial de la República de Cuba, Edición Extraordinaria No. 5.

<https://www.gacetaoficial.gob.cu/es/constitucion-de-la-republica-de-cuba-proclamada-el-10-de-abril-de-2019>

Asamblea Nacional del Poder Popular. (2022). *Ley de Soberanía Alimentaria y Seguridad Alimentaria y Nutricional* (Ley 148). Gaceta Oficial de la República de Cuba, Edición Ordinaria No. 77. <https://www.gacetaoficial.gob.cu/es/ley-148-de-2022-de-asamblea-nacional-del-poder-popular>

- Dávila Hernández, G. R., Mirabales Rodríguez, P. D., Pérez Lara, A., & Hernández Beltrán, Y. (2019). Cadena productiva del frijol común en cooperativas agropecuarias: Propuesta de intervención del proyecto AGROCADENAS. *Cooperativismo y Desarrollo*, 7(2), 275-285. <https://coodles.upr.edu.cu/index.php/coodles/article/view/244>
- Fao. (2017). *¿Cómo pueden modelarse las cadenas de valor para mejorar la nutrición?* (Foro Global sobre Seguridad Alimentaria y Nutrición de la FAO). Organización de Naciones Unidas para la Alimentación y la Agricultura. <https://www.fao.org/fsnforum/es/resources/como-pueden-modelarse-las-cadenas-de-valor-para-mejorar-la-nutricion>
- Labrador Machín, O., Mirabal González, Y., & Torres Paez, C. C. (2020). Potencialidades del cooperativismo agropecuario en función de la soberanía alimentaria y educación nutricional. *Cooperativismo y Desarrollo*, 8(3), 587-602. <https://coodles.upr.edu.cu/index.php/coodles/article/view/401>
- Minag. (2020). *Plan de soberanía alimentaria y educación nutricional de Cuba*. Ministerio de la Agricultura. [https://www.minag.gob.cu/sites/default/files/noticias/documentos\\_complementarios.rar](https://www.minag.gob.cu/sites/default/files/noticias/documentos_complementarios.rar)
- Nutz, N., & Sievers, M. (2016). *Guía general para el desarrollo de cadenas de valor*. Organización Internacional del Trabajo. [http://www.ilo.org/empent/areas/value-chain-development-vcd/WCMS\\_541432/lang-es/index.htm](http://www.ilo.org/empent/areas/value-chain-development-vcd/WCMS_541432/lang-es/index.htm)
- Peña, Y., Nieto Alemán, P. A., & Díaz Rodríguez, F. (2008). Cadenas de valor: Un enfoque para las agrocadenas. *Equidad y Desarrollo*, (9), 77-85. <https://doi.org/10.19052/ed.279>
- Ramos Crespo, M. E., & González Pérez, M. M. (2019). Modelo de gestión de la seguridad alimentaria y nutricional desde el gobierno a escala municipal. *Revista Economía y Desarrollo*, 162(3). <http://www.econdesarrollo.uh.cu/index.php/RED/article/view/777>

### **Conflict of interest:**

Authors declare not to have any conflict of interest.

### **Authors' contribution:**

*María Eugenia Ramos Crespo* designed the study, analyzed the data and prepared the draft.

*Jesús Darío Gorgoy Rodríguez and Yamilet Mirabal Sarria* were involved in data collection, analysis and interpretation.

*Onai Martínez Díaz* was involved in the design of the proposal, data collection, analysis and interpretation.

All the authors reviewed the writing of the manuscript and approve the version finally submitted.



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