Challenges of Management 2021; 15(2): 136-165

Article

Evaluation of Conditions at the Touristic Destination of Santiago de Cuba for Insertion in Production Chains

Evaluación del polo turístico Santiago de Cuba para su inserción en cadenas productivas

Javier Díaz Pozo[1*] http://doi.org/ 0000-0002-9560-0812
Graciela María Castellanos Pallerols[2] http://doi.org/0000-0003-2542-5972
Norma Rafaela Hernández Rodríguez[2] http://doi.org/ 0000-0002-2086-2236
Rosario León Robaina[3] http://doi.org/ 0000-0001-5397-777X

[1]Department of Economy, Faculty of Economic Sciences, the Ignacio Agramonte University of Camagüey, Camagüey, Cuba.
[2]Center for Business and Territorial Studies, Faculty of Economic and Entrepreneurial Sciences, University of Oriente, Cuba.
[3]Department of Tourism, Faculty of Economic and Entrepreneurial Sciences, University of Oriente, Cuba.

*Correspondence: javierdp@uo.edu.cu

ABSTRACT

Aim: This research evaluated the hotel system in the touristic destination of Santiago de Cuba, in order to identify potentialities and limitations for the insertion in production chains.

Methods: The procedure suggested the combination of three tools: the regional analysis technique, cluster mapping, and adjustment of the input-product matrix according to regional data, and records provided by the Ministry of Tourism in the province, and the National Office of Statistics and Information, plus the collection of direct information, interviews, brainstorming, and expert opinion. SPSS version 22.0, Decision, and Microsoft Excel 2016, were also included.

Main results: The results of this study determined that the touristic destination evaluated has conditions for insertion in production chains, with a higher potential for materialization of the relationship between suppliers outside the sector, like Frutas Selectas and PESCASAN, and the Melia Santiago and Sierra Mar hotels.

Conclusions: At the end of the procedure, it was concluded that Santiago de Cuba tourist destination can be part of production chains that not only contribute to the development of tourism, but also to production sectors in the territory.

Key words: production chains; production capacities; touristic destination.

RESUMEN

Objetivo: La investigación se sustentó en la evaluación del sistema hotelero del polo turístico Santiago de Cuba con el objetivo de identificar potencialidades y limitaciones para su inserción en cadenas productivas.

Métodos: El procedimiento aplicado se fundamentó en la combinación de tres herramientas: técnica de análisis regional, cluster mapping y una adecuación de la matriz insumo-producto a partir de datos y registros aportados por la Delegación del Ministerio de Turismo y la Oficina Nacional de Estadística e Información; además de la observación directa, entrevistas, tormenta de ideas y el criterio de expertos. Se utilizaron los softwares SPSS versión 22.0, Decisión y Microsoft Excel 2016.

Principales resultados: Los resultados del estudio determinaron que el polo turístico seleccionado posee condiciones para lograr encadenamientos productivos, con mayores potencialidades de materialización en la relación dada entre los proveedores ajenos al sector Frutas Selectas y PESCASAN y los hoteles Meliá Santiago y Sierra Mar.

Conclusiones: Luego de finalizar el procedimiento se puede concluir que el polo turístico Santiago de Cuba tiene condiciones para lograr encadenamientos productivos que contribuyan no solo al desarrollo del turismo, sino también de los sectores productivos del territorio.

Palabras clave: encadenamientos productivos; capacidades productivas; polo turístico.

Received: 02/22/2021
Approved: 05/07/2021

INTRODUCTION

The current models of economic development demand companies to implement initiatives that ensure competitive quality standards to strengthen their survival in the market. The collaboration perspectives supported by the articulation of production contribute thoroughly to improvements in business capacities. Hence, the level of socio-territorial arrangement complements and broadens the efficiency of organizations inside production chains. Accordingly, the organization of projects for the articulation of production as part of territorial arrangement cannot be separated, since they help speed up or delay the evolution of productivity generated by mere economic relations (Alburquerque, 2004).

Studies of production under territorial arrangement, local development, and production articulation conducted by Cuban researchers coincide somehow in that development management in most Cuban locations is seen with a functional and operational approach that relies on a) the lack of proper articulation of horizontal relations established at the same level; b) the verticality of economic decisions that limit the leadership of local authorities; c) the absence of a comprehensive policy for all the actors involved at the territorial level; and d) the little relation between the needs of a location and the sectoral interests on nationally-run companies, as explained by Madruga (2015), and cited by Correa (2018).

The above demonstrates that the insufficient ties of the commercial relation and relational gaps defined by Madruga (2015) between and within the local economic areas is one of the primordial terms that block production chains, and that the mechanisms of goods manufacturing are in charge of organizing the links or bonds inside and outside these sectors, which encourage local development truly.

Tourism has ramifications in most business areas, so denying their potential in terms of relations and business means refusing a fruitful context of trading and marketing; an absurd assumed by those who see the industry solely as a folkloric, recreational, and leisure activity, far from the current political and economic rationale on this sector in Cuba. Specifically, in the hotel business, it brings about a series of issues regarding the quality levels desired for the services offered, which leads to higher costs and obstacles to the development of the system of logistics in their facilities, with the ensuing negative repercussion on the satisfaction of customer's needs and expectations.

One example is the following deficiencies observed in the stock of problems of the Ministry of Tourism (MINTUR), in 2018: instability of supplies by providers –both within the sector and outside–, which causes lack of compliance with quality standards and customer dissatisfaction, as well as a poor variety and quantity of supplies, which means that the demands from hotels are unmet in terms of services, along with an insufficient utilization of production forms for supplying the hotels of the tourist destination. Hence, the priority must focus on the generation of alternatives that contribute to improvements in hotel management; however, the implementation and development of articulating ways of production, such as production chains in Cuba, particularly in tourism, still falls short. Accordingly, the purpose of this study is to evaluate the hotel system in destination Santiago de Cuba to identify the potentials and limitations to join production chains.

DEVELOPMENT

Production chains first appeared in the 1950s, thanks to studies that showed a systematic vision of agriculture, with the interconnection of all its processes to offer consumers the full range of farm products. The theory emerges from the confluence of two research lines, one as the consequence of the efforts to find a notion of development that encouraged local development and/or that of territories, and another that derived from the analysis of endogenous industrial development processes in locations and regions in the south of Europe.

There are quite a few definitions of production chains, which have been made since the beginning to now. One of the most widely known is the one stated by Hirschman (1958), who set forward and reverse supply chain concepts. In that sense, Isaza (2009) noted:

> (...) back chains are made of decisions of investment and cooperation to strengthen the production of raw materials and capital needed to create particular products. Meanwhile, forward supply chains emerge as a need of entrepreneurs to promote the creation and diversification of new markets for trading existing goods. (p. 11)

Production chains include an important implicit element created by their nature: the value chain, a fundamental managing tool to identify the activities of a company that might bring potential competitive advantages. The set of activities implemented when competing in a sector, which can be pooled in two categories: the ones related to production, sales, delivery, and post-sale; and other activities that provide human and technological resources, inputs, and infrastructure. This authors refer to the value chains inside companies, which does not equal production chains; however, he says that extra-company value chains are part of a system defined by him as value system. The value system takes the value chains of suppliers, retailers, and buyers, so it can be said that production chains and value systems are equivalent concepts, according to Porter.

Another aspect related to production chains, which are fundamental in his study, is the conglomerates, understood as a group of companies that embody an important number of interrelated entities of the same and/or economic activities, forming production chains. The extension and generalization of that notion lies in its potential to describe and at least, apparently, explain the heterogeneity of the spatial distribution of business, as well as specialization and competitiveness of regions in certain production activities.

The complex grid of implicit relations in the articulation of production shows that beyond economic platforms there is an institutional, social, political, and cultural

frame that requires local acknowledgment. Especially, coherent internal organization and structuring of regions that ensure the creation of production units, and the emergence of business entities that foster territorial growth and the flow of investments.

Particularly, business organizations are an essential component of this process. So, as long as they can implement technological advances, higher profitability, and the materialization of scientific research, they will settle down as providers of productivity, competitiveness, and economic progress. Hence, the level of association and development of cooperation ties among them are based on production chains as forms of the articulation of production, and can contribute to increasing commercial performance, and the promotion of growth and foundations to develop proper settings for the promotion of technical capacity and the formation of capital.

This innovating concept offers important elements to the design of business support policies that favor the generation of wealth through the consolidation of competitive advantages (Madruga, 2015). The nature of functioning permits it to meet the specific demands of a particular territory, and become a source of social improvements in terms of income and employment. It is a way of building professional advancement through which their key actors (private or public) mature and create awareness of their roles in terms of business and national development, in territorial and local settings, with external projections (Isaza, 2009).

For some time, the Cuban government has been laying out strategies to encourage local development, especially in the last decade, which intensifies the validity of the current re-adjustment of the economy.

This research is in keeping with the guidelines defined in the ruling documents of the Conceptualization of the Cuban Economic and Social Model of Socialist Development, and the National Plan for Economic Development to 2030 (PCC, 2016), which encourage “endogenous development by strengthening attributions and planning and territorial capacities (...) to promote the utilization of local resources” (p. 19); and to “encourage production chains inside the country (...), managing and production arrangement models” (p. 20).

It includes three tools: the technique of regional analysis (TAR) (Lira and Quiroga, 2009), cluster mapping (Porter, 1998), and adjustment of the input-product matrix (Leontief, 1936). The first one consists of a diagnostic that determines the congruency of the local economic structure chosen, with a resource base made of two matrices: sector-region (SECRE), and region-region (REGRE), but only the former was used, since the aim of the study was to estimate a series of coefficients to arrange the information that characterizes the particular tourist destination chosen, depending on its conditions for insertion in production chains. Thus, comparisons based on the previously selected economic indicator can be established. The second (cluster mapping) was used to assess the existence of conditions for entities within the destination to participate in production chains, depending on the spatial competency and patterns of geographical localization they might have, through the calculation of coefficients. The third –a methodological adjustment of the input-product matrix (I-P matrix)– is used to contrast and explain the behavior of the flow of commercial exchange among the actors included in the study based on the economic indicators selected.

Procedure to identify the potentials and limitations for joining production chains in the hotel system of destination Santiago de Cuba

The procedure consists of two phases and their stages and logical steps, represented by the application of every previously mentioned tool to fulfill the aim of this research. The information platform corresponding to the period with the greatest service supply (the high season) in 2010 and 2018, used as base and current years of study, respectively.

Phase 1. Characterization of the economic structure of the territory

Objective: To identify the internal and external potentialities of the tourist destination.

Stage 1. Preparatory

Objective: To conceive a series of preliminary aspects that lay the ratoinale of the study.

Step 1. Selection of the group of experts

A highly knowledgeable group was assembled consisting of specialists with a broad experience in the profession, and willing to join the team. The information was

processed using the application Decision, with easy-to-use interfaces related to techniques of multi attribute, thus reducing the complexity of deciding who has qualities to be an expert or not. A total of nine individuals with a high competence coefficient ($K \geq 0.8$) were chosen.

Step 2. Selection of contrasting parameters

Upon the review of the informational base of the tourist destination, interviews at MINTUR offices, and consultations to previously selected experts, the parameters for contrasting were hotels and hotel complexes in the tourist destination, as well as inside and outside suppliers. In the two cases, the most representative cases were selected according to the level of hotel activity and the margin of contribution with respect to suppliers, as shown in Table 1.

Table 1 Selected hotels and suppliers

Hotels	**Suppliers**
Sierra Mar	ITH
Versalles	EMPRESTUR
Meliá Santiago	SERVISA
Balcón del Caribe	Frutas Selectas
Complejo Casa Granda-Imperial	PESCASAN
Las Americas Complex	Cuba Ron
Libertad-Rex Complex	Lácteos Santiago
Carisol-Corales Complex	Los Portales
Costa Morena-Gran Piedra Complex	Tabacuba

Source: made by the authors

Step 3. Selection of the indicator for the research

The best indicator for this type of study is the level of employment of a given region, though it will not be used in this research since its instability in this sector throughout the year might produce a significant distortion of the results. Additionally, this indicator has other two constraints:

- Sectors with little representation in the economy may not be present or have a limited representation in many regions, causing significant correlations.

- Heavily established sectors in large regions can show high correlations merely because of that circumstance, without an interrelation between them.

The selection of the indicator will be based on the knowledge of the economic branch in particular and the information about commercial exchanges. Consequently, it is important to use the greatest possible sectoral desegregation. Hence, the inventory is expressed in the value of money, and its selection can be explained by the descriptive power of this value over commercial trading of hotels (goods possessed and needed, and credit movement, liabilities and equities) with their providers.

Step 4. The SECRE Matrix

A SECRE matrix was designed, placing the values of inventory from suppliers and hotels in rows and columns, respectively (Fig. 1).

H_j/P_i	H_1	H_2	...	H_m	$\sum_{j=1}^{m} V_{ij}$
P_1	V_{11}	V_{12}	...	V_{1m}	V_{1j}
P_2	V_{21}	V_{22}	...	V_{2m}	V_{2j}
...	...	...	...	...	...
P_n	V_{n1}	V_{n2}	...	V_{nm}	V_{nj}
$\sum_{i=1}^{n} V_{ij}$	V_{i1}	V_{i2}	...	V_{im}	$\sum_{i=1}^{n}\sum_{j=1}^{m} V_{ij}$

Fig. 1 The SECRE Matrix

Source: Pérez (2013).

Where:

H_j:j^{th} hotel

m: Total of hotels

P_i: i^{th} supplier

n: Total of suppliers

V_{ij}: Inventory value corresponding to supplier i and hotel j ratio

$\sum_{j=1}^{m} V_{ij}$: Total value of the i supplier's inventory with each hotel

$\sum_{i=1}^{n} V_{ij}$: Total value of inventory for the j hotel with every supplier

$\sum_{i=1}^{n}\sum_{j=1}^{m} V_{ij}$: Total cross value of inventory for the total of hotels and suppliers

Stage 2 Intra-regional analysis

Objective: To compare an element in the matrix column to itself and to the other elements in the columns.

Step 5. Coefficient of internal specialization

$$E_{int} = \frac{V_{ij}}{\sum_{i=1}^{n} V_{ij}} \qquad (1)$$

Where:

E_{int}: Coefficient of internal specialization

The determination of this coefficient revealed that the greatest inventory indexes from the onset year and to 2018 were given by the commercial relations established between the supplier of tourism (ITH) with the Libertad-Rex Complex, Balcon del Caribe Hotel, Casa Granda-Imperial Complex, and Versalles Hotel. However, other suppliers outside the sector were found to have outstanding ties both in the onset year and 2018, such as Frutas Selectas, PESCASAN, and Cuba Ron (Table 2).

Table 2. Coefficients of internal specialization 2018

Hotels/Suppliers	Sierra Mar	Carisol-Corales Complex	Versalles	Meliá Santiago	Casa Granda-Imperial Complex	Balcón del Caribe	Las Americas Complex	Costa Morena-Piedra GRan	Libertad-Rex Complex	Total from the destination
ITH	0.181	0.226	0.413	0.184	0.332	0.490	0.199	0.232	0.517	0.247
EMPRESTUR	0.159	0.201	0.174	0.152	0.187	0.100	0.166	0.174	0.108	0.164
SERVISA	0.161	0.150	0.062	0.109	0.064	0.079	0.134	0.111	0.052	0.118
Frutas Selectas	0.136	0.132	0.105	0.125	0.086	0.050	0.125	0.101	0.049	0.115
PESCASAN	0.112	0.093	0.074	0.116	0.085	0.061	0.113	0.100	0.072	0.101
Cuba Ron	0.067	0.078	0.034	0.110	0.036	0.050	0.074	0.049	0.053	0.072
Lácteos Santiago	0.013	0.014	0.039	0.010	0.074	0.049	0.011	0.070	0.059	0.027
Los Portales	0.079	0.069	0.032	0.096	0.031	0.029	0.090	0.069	0.034	0.072

Tabacuba	0.093	0.037	0.067	0.097	0.105	0.092	0.088	0.092	0.057	0.084

The values highlighted in red in the tables indicate numbers with greater significance, from which the conditions of suppliers were evaluated in terms of cluster creation.

Source: Made by the authors

Step 6. Coefficient of external specialization

$$E_{ext} = \frac{\frac{V_{ij}}{\sum_{i=1}^{n} V_{ij}}}{\frac{\sum_{j=1}^{m} V_{ij}}{\sum_{i=1}^{n}\sum_{j=1}^{m} V_{ij}}} = \frac{E_{int\,Hotel_j}}{E_{int_{Destination}}} \quad (2)$$

Where:

E_{ext}: Coefficient of external specialization

$E_{int\ Hotel\ j}$: Internal specialization of the j hotel

$E_{int\ Destination}$: Internal specialization of the tourist destination

The calculation of this coefficient results in most values above 1, which means that there is a tendency of trading by suppliers to the hotels individually, rather than the whole tourist destination in general, beside showing their rankings (Table 3).

Table 3. Coefficients of external specialization 2018

Hotels/Suppliers	**Sierra Mar**	**Carisol-Corales**	**Versalles**	**Meliá Santiago**	**Casa Granda-Imperial Complex**	**del Balcón Caribe**	**Las Americas Complex**	**Costa Morena-GRan Piedra**	**Libertad Complex**
ITH	0.535	0.552	0.518	1.912	0.513	0.533	0.554	0.546	0.494
EMPRESTUR	1.357	1.530	1.265	0.513	1.105	1.079	1.362	1.147	0.999
SERVISA	1.528	1.313	0.574	0.568	1.269	1.225	1.282	1.122	1.341
Frutas Selectas	1.343	1.239	1.160	0.467	0.917	1.373	1.410	1.271	1.426
PESCASAN	1.284	1.074	1.010	0.498	1.186	1.258	1.496	1.288	1.331
Cuba Ron	0.888	1.016	1.404	0.611	1.414	1.122	1.531	1.016	1.047

Lácteos Santiago	1.062	1.378	0.364	0.712	1.969	1.054	0.771	1.560	1.110
Los Portales	1.023	1.097	2.239	0.582	0.910	1.452	0.609	1.386	1.536
Tabacuba	1.117	1.033	1.911	0.583	1.504	1.301	0.687	1.258	1.281

Source: Made by the authors

Step 7. Coefficient of diversification

$$Q^E = \frac{1}{2}\sum_{i=1}^{n}\left|\frac{V_{ij}}{\sum_{i=1}^{n} V_{ij}} - \frac{\sum_{j=1}^{m} V_{ij}}{\sum_{i=1}^{n}\sum_{j=1}^{m} V_{ij}}\right| = \frac{1}{2}\sum_{i=1}^{n}\left|E_{int\ Hotel_j} - E_{int\ Destination}\right| \quad (3)$$

Where:

Q^E: Coefficient of diversification

From the base year to 2018 there were moderate structural differences (Table 4) in all the facilities studied, as a result of improvements and expansion of the hotel infrastructure as a response to the tourist peak that occurred by mid-2016. The Libertad-Rex Complex and Balcon del Caribe and Versalles Hotels showed a remarkable performance, with the greatest difference regarding the tourist destination.

Table 4. Scales of coefficient classification

Diversification		**Restructuring**		**Location**	
Classification	Scale	Classification	Scale	Classification	Scale
Moderate	0.10 ≤ QE < 0.30	Moderate	0.10 ≤ QR < 0.30	Null	0.10 ≤ QL < 0.30
Significant	0.30 ≤ QE < 0.50	Significant	0.30 ≤ QR < 0.50	Moderate	0.30 ≤ QL < 0.50
Very significant	0.50 ≤ QE < 0.65	Very significant	0.50 ≤ QR < 0.65	Significant	0.50 ≤ QL < 0.65
Intense	QE ≥ 0.65	Intense	QR ≥ 0.65	Intense	QL ≥ 0.65
Association		**Redistribution**			
Moderate	0.10 ≤ CA < 0.30	Moderate	0.10 ≤ CR < 0.30		
Significant	0.30 ≤ CA < 0.50	Significant	0.30 ≤ CR < 0.50		
Very	0.50 ≤ CA < 0.65	Very significant	0.50 ≤ CR < 0.65		

significant			
Intense	CA ≥ 0.65	Intense	CR ≥ 0.65

Source: Made by the authors

Table 5. Coefficient of diversification (2018)

	Sierra Mar	Carisol-Corales	Versalles	Meliá Santiago	Casa Granda-Imperial Complex	Balcón del Caribe	Las Americas Complex	Costa Morena-GRan Piedra Complex	Libertad-Rex Complex
ITH	0.066	0.021	0.166	0.063	0.085	0.243	0.047	0.014	0.270
EMPRESTUR	0.005	0.037	0.010	0.012	0.023	0.064	0.002	0.011	0.056
SERVISA	0.043	0.033	0.056	0.009	0.053	0.039	0.016	0.006	0.066
Frutas Selectas	0.021	0.017	0.010	0.010	0.029	0.065	0.010	0.014	0.066
PESCASAN	0.010	0.009	0.027	0.014	0.017	0.041	0.011	0.001	0.029
Cuba Ron	0.005	0.006	0.037	0.039	0.036	0.022	0.002	0.023	0.019
Lácteos Santiago	0.014	0.013	0.012	0.017	0.047	0.022	0.016	0.043	0.032
Los Portales	0.007	0.003	0.040	0.023	0.041	0.043	0.017	0.003	0.038
Tabacuba	0.009	0.047	0.017	0.013	0.020	0.008	0.004	0.008	0.027
Σ	0.180	0.186	0.377	0.199	0.352	0.547	0.126	0.124	0.603
Σ/2	0.090	0.093	0.188	0.100	0.176	0.273	0.063	0.062	0.301

Source: Made by the authors

Step 8 Coefficient of restructuring

$$Q^R = \frac{1}{2}\sum_{i=1}^{n}\left|\frac{V_{ij}^{t_1}}{\sum_{i=1}^{n} V_{ij}^{t_1}} - \frac{V_{ij}^{t_0}}{\sum_{i=1}^{n} V_{ij}^{t_0}}\right| = \frac{1}{2}\sum_{i=1}^{n}\left|E_{int\ Hotel_j}^{t_1} - E_{int\ Hotel_j}^{t_0}\right| \qquad (4)$$

Where:

Q^R: Coefficient of restructuring

$E^t_{1\ int\ Hotel\ j}$: Internal specialization of the j hotel in 2018.

$E^t_{0\ int\ Hotel\ j}$: Internal specialization of the j hotel in the base year.

In the period analyzed, most hotels of tourist destination Santiago de Cuba have undergone moderate restructuring due to the previously stated reasons (Table 4).

However, such changes were significant in the Versalles Hotel and the Liberty-Rex Complex, both organizational and in infrastructure, between the base year and 2018 (Table 6).

Table 6. Coefficients of restructuring

Hotel/Supplier	Sierra Mar	Carisol-Corales Complex	Versalles	Meliá Santiago	Casa Granda-Imperial Complex	Balcón del Caribe	Las Americas Complex	Costa Morena-GRan Piedra Complex	Libertad Complex
ITH	0.005	0.045	0.243	0.445	0.163	0.314	0.017	0.053	0.354
EMPRESTUR	0.003	0.025	0.029	0.093	0.060	0.024	0.010	0.043	0.007
SERVISA	0.015	0.025	0.007	0.055	0.056	0.038	0.011	0.005	0.076
Frutas Selectas	0.001	0.008	0.012	0.078	0.006	0.088	0.016	0.026	0.094
PESCASAN	0.001	0.002	0.015	0.072	0.020	0.050	0.019	0.013	0.045
Cuba Ron	0.017	0.018	0.098	0.053	0.097	0.056	0.071	0.047	0.046
Lácteos Santiago	0.034	0.047	0.023	0.021	0.012	0.003	0.023	0.001	0.010
Los Portales	0.019	0.005	0.099	0.062	0.022	0.056	0.054	0.012	0.056
Tabacuba	0.009	0.041	0.077	0.053	0.009	0.006	0.036	0.003	0.040
Σ	0.105	0.217	0.603	0.931	0.448	0.634	0.257	0.204	0.727
Σ/2	0.053	0.109	0.302	0.466	0.224	0.317	0.129	0.102	0.364

Source: Made by the authors

Stage 3 Inter-regional analysis

Objective: To compare an element in the matrix row to itself and to the other elements in the rows.

Step 9. Determination of the structure coefficient

$$E_{str} = \frac{V_{ij}}{\sum_{j=1}^{m} V_{ij}} \qquad (5)$$

Where:

E_{str}: Structure coefficient

The greatest business value in the period was found between Hotel Melia Santiago and the sector's supplier (ITH), as well as with suppliers outside the sector (Table 7).

Table 7. Structure coefficients (2018)

Hotel/Supplier	Sierra Mar	Carisol-Corales Complex	Versalles	Meliá Santiago	Granda-Casa Imperial	del Balcón Caribe	Americas Las Complex	Morena-Piedra Costa GRan Complex	Libertad-Rex Complex	Total destination
ITH	0.048	0.046	0.037	0.647	0.042	0.037	0.067	0.043	0.032	1.000
EMPRESTUR	0.121	0.127	0.091	0.174	0.090	0.075	0.166	0.091	0.065	1.000
SERVISA	0.136	0.109	0.041	0.192	0.103	0.085	0.156	0.089	0.088	1.000
Frutas Selectas	0.120	0.103	0.084	0.158	0.075	0.095	0.172	0.100	0.093	1.000
PESCASAN	0.115	0.089	0.073	0.169	0.096	0.087	0.182	0.102	0.087	1.000
Cuba Ron	0.079	0.085	0.101	0.207	0.115	0.078	0.186	0.080	0.068	1.000
Lácteos Santiago	0.095	0.115	0.026	0.241	0.160	0.073	0.094	0.123	0.072	1.000
Los Portales	0.091	0.091	0.161	0.197	0.074	0.101	0.074	0.110	0.100	1.000
Tabacuba	0.100	0.086	0.138	0.197	0.122	0.090	0.084	0.099	0.084	1.000
Σ	0.906	0.852	0.752	2.183	0.877	0.722	1.181	0.837	0.690	9.000
Total coefficients	0.101	0.095	0.084	0.243	0.097	0.080	0.131	0.093	0.077	

Source: Made by the authors

Step 10. Determination of the location coefficient

$$Q^L = \frac{1}{2}\sum_{j=1}^{m}\left|\frac{V_{ij}}{\sum_{j=1}^{m} V_{ij}} - \frac{\sum_{j=1}^{m} V_{ij}}{\sum_{i=1}^{n}\sum_{j=1}^{m} V_{ij}}\right| = \frac{1}{2}\sum_{j=1}^{m}\left|E_{\text{str}\ \ Hotel_j} - \sum_{j=1}^{m} E_{est\,\text{Destination}}\right| \qquad (6)$$

Where:

Q^L: Location coefficient

$E_{str\ Hotel\ j}$: Structure coefficient of j hotel

$E_{str\ Destination}$: Structure coefficient of the destination

In this period (2010-2018), the coefficient evidenced a high generalized concentration (Tables 4 and 8).

Table 8 Location coefficients (2018)

Suppliers/Hotels	Sierra Mar	Carisol-Corales Complex	Versalles	Meliá Santiago	Casa Granda-Imperial Complex	Balcón del Caribe	Las Americas	Costa Morena-GRan Piedra	Libertad-Rex Complex	Σ	Σ/2
ITH	0.952	0.954	0.963	0.353	0.958	0.963	0.933	0.957	0.968	8.000	4
EMPRESTUR	0.879	0.873	0.909	0.826	0.910	0.925	0.834	0.909	0.935	8.000	4
SERVISA	0.864	0.891	0.959	0.808	0.897	0.915	0.844	0.911	0.912	8.000	4
Frutas Selectas	0.880	0.897	0.916	0.842	0.925	0.905	0.828	0.900	0.907	8.000	4
PESCASAN	0.885	0.911	0.927	0.831	0.904	0.913	0.818	0.898	0.913	8.000	4
Cuba Ron	0.921	0.915	0.899	0.793	0.885	0.922	0.814	0.920	0.932	8.000	4
Lácteos Santiago	0.905	0.885	0.974	0.759	0.840	0.927	0.906	0.877	0.928	8.000	4
Los Portales	0.909	0.909	0.839	0.803	0.926	0.899	0.926	0.890	0.900	8.000	4
Tabacuba	0.900	0.914	0.862	0.803	0.878	0.910	0.916	0.901	0.916	8.000	4

Source: Made by the authors

Step 11. Determination of the association coefficient

$$CA = \frac{1}{2}\sum_{j=1}^{m}\left|\frac{V_{ij}^{K}}{\sum_{j=1}^{m} V_{ij}^{K}} - \frac{V_{ij}^{L}}{\sum_{j=1}^{m} V_{ij}^{L}}\right| = \frac{1}{2}\sum_{j=1}^{m}\left|E_{str\ Supplier_1} - E_{str\ Supplier_2}\right| \qquad (7)$$

Where:

CA: Association coefficient

V_{ij}^{K}: Value of K supplier 1 activity

V_{ij}^{L}: Value of K supplier 2 activity

$E_{str\ supplier\ 1}$: Structure coefficient of supplier 1

$E_{str\ supplier\ 2}$: Structure coefficient of supplier 2

The calculation of this coefficient relied completely on ITH, since it is the greatest and full supplier of tourism in the territory. The time cycle analysis showed

associations of significant activities by suppliers outside the sector with ITH (Tables 4 and 9).

Table 9. Association coefficients

Hotels/Suppliers	Sierra Mar	Carisol-Corales Complex	Versalles	Meliá Santiago	Granda-Casa Imperial Complex	Balcón del Caribe	Americas Las Complex	Morena-Piedra Costa GRan	Libertad-Rex Complex	Σ	Σ/2
ITH	0.073	0.081	0.054	0.474	0.048	0.038	0.098	0.048	0.033	0.947	0.474
EMPRESTUR	0.089	0.063	0.004	0.455	0.062	0.048	0.089	0.046	0.055	0.910	0.455
SERVISA	0.072	0.057	0.046	0.489	0.033	0.058	0.104	0.057	0.061	0.978	0.489
Frutas Selectas	0.067	0.043	0.035	0.479	0.055	0.050	0.115	0.059	0.055	0.958	0.479
PESCASAN	0.032	0.039	0.064	0.440	0.073	0.041	0.119	0.037	0.036	0.881	0.440
Cuba Ron	0.047	0.069	0.011	0.406	0.118	0.036	0.026	0.080	0.040	0.834	0.417
Lácteos Santiago	0.044	0.045	0.124	0.450	0.032	0.064	0.007	0.066	0.068	0.900	0.450
Los Portales	0.052	0.040	0.100	0.450	0.081	0.053	0.016	0.056	0.051	0.900	0.450
Tabacuba	0.073	0.081	0.054	0.474	0.048	0.038	0.098	0.048	0.033	0.947	0.474

Source: Made by the authors

Step 12. Determination of the redistribution coefficient

$$CR = \frac{1}{2}\sum_{j=1}^{m}\left|\frac{V_{ij}^{Kt_1}}{\sum_{j=1}^{m} V_{ij}^{Kt_1}} - \frac{V_{ij}^{Lt_0}}{\sum_{j=1}^{m} V_{ij}^{Lt_0}}\right| = \frac{1}{2}\sum_{i=1}^{n}\left|E^{t_1}_{\text{str Supplier}_1} - E^{t_0}_{\text{str Supplier}_1}\right| \quad (8)$$

Where:

CR: Redistribution coefficient

V_{ij}^{K} (t^1): Value of K supplier 1 activity in 2018

V_{ij}^{L} (t0): Value of L supplier 1 activity in the base year

$E^{t}_{1\ str\ supplier\ 1}$: Structure coefficient of supplier 1 in 2018

$E^{t}_{0\ str\ supplier\ 1}$: Structure coefficient of supplier 1 in 2018

In the time horizon selected, the concentration of activities has taken place moderately in most suppliers (Table 4), being significant only in the cases of ITH and Los Portales (Table 10).

Table 10. Redistribution coefficients (2018)

Hotels/Suppliers	Sierra Mar	Carisol-Corales Complex	Versalles	Meliá Santiago	Granda-Casa Imperial Complex	Balcón del Caribe	Americas Las Complex	Costa Morena-GRan Piedra Complex	Libertad-Rex Complex	Σ	Σ/2
ITH	0.070	0.067	0.061	0.485	0.060	0.052	0.085	0.045	0.044	0.969	0.485
EMPRESTUR	0.034	0.024	0.029	0.029	0.004	0.048	0.026	0.009	0.041	0.242	0.121
SERVISA	0.082	0.048	0.011	0.010	0.062	0.055	0.059	0.000	0.071	0.398	0.199
Frutas Selectas	0.069	0.039	0.030	0.078	0.018	0.076	0.034	0.018	0.077	0.439	0.220
PESCASAN	0.062	0.023	0.030	0.080	0.033	0.060	0.028	0.009	0.061	0.387	0.194
Cuba Ron	0.069	0.048	0.073	0.129	0.077	0.046	0.008	0.016	0.041	0.509	0.254
Lácteos Santiago	0.020	0.053	0.059	0.157	0.049	0.009	0.015	0.121	0.007	0.490	0.245
Los Portales	0.084	0.027	0.135	0.091	0.041	0.083	0.160	0.020	0.083	0.724	0.362
Tabacuba	0.078	0.032	0.091	0.055	0.028	0.041	0.115	0.003	0.059	0.502	0.251

Source: Made by the authors

Stage 4. Cluster mapping

Objective: To evaluate the existence of conditions so that the companies in the study become part of production chains.

The implementation of this tool will help classify the suppliers into three groups with spatial competency guides, and uneven geographical location standards: local, dependent on resources or saleable. Only the ones classified in the last group are eligible for possible chains.

Step 13. Analysis of external specialization coefficients (E_{ext})

The E_{ext} were examined before calculation in step six, stage two for all the suppliers; the ones equal to or greater than 1 were selected to set their corresponding cells.

Step 14. Substitution of external specialization coefficients

The E_{str} obtained in step nine, stage three, were placed in the selected E_{ext} cells in the previous step, and were added by rows. The cutoff of the sums was 50%; the equal to or greater values constitute the first criterion for the classification of suppliers (Table 11).

Table 11 Criteria for the classification of suppliers

Criteria	Levels of compliance	Classification
	Suppliers that meet one or no criterion	Local
$\sum_{p=1}^{q} E_{ext} \geq 50\%$		
	Suppliers that meet two criteria	Resource dependent
$\overline{X}\ ext = \frac{\sum_{p=1}^{q} E_{ext}}{q} \geq 1.5$		
	Suppliers that meet the three criteria	Saleable
$G \geq 0.3$		

Source: Made by the authors

Step 15. Selection of significant coefficients of external specialization

A maximum of five cells with the greatest E_{ext} values were selected by rows in step 13, and their averages were calculated. The cutoff point was 1.5%; the equal or greater values constitute the first criterion for the classification of suppliers (Table 11).

Step 16. Determination of the Gini association

Generally, this coefficient is used to measure the difference between the income of a particular country or region; however, it can be applied to measure any variable with an unequal distribution. It is widely used in TAR to measure the level of concentration and clustering of the variable studied; when the value nears 1, it means a high concentration of the variable and a sign of clustering; a value nearing 0 means it is interpreted otherwise.

$$G = \left| 1 - \sum_{k=1}^{n-1} (X_{k+1} - X_k)\,(Y_{k+1} + Y_k) \right| \qquad (9)$$

Where:

G: Gini coefficient
k: Suppliers
n: Total of suppliers

X_{K+1} - X_K: Variation of the inventory proportion
Y_{K+1} + Y_K: Increase of the proportion of the gross value added

The Gini coefficients of all the suppliers were determined, considering that their proximity to 1 indicates serious evidence of clustering. The cutoff point was 0.3; from which the third and last criterion for supplier classification was established (Table 11).

Step 17. Classification of suppliers

The suppliers were classified according to the three criteria shown in Table 11, whose results are shown in Table 12.

Table 12. Classification of suppliers

Suppliers	First criterion	Second criterion	Third criterion	Classification
ITH			0.3	Local
EMPRESTUR	70%		03	Resource dependent
SERVISA	60%		0.3	Resource dependent
Frutas Selectas	90%	1.5	0.3	Saleable
PESCASAN	70%	1.7	0.4	Saleable
Cuba Ron	80%	1.8		Resource dependent
Lácteos Santiago	50%	2.4		Resource dependent
Los Portales	50%	2.4	0.5	Saleable
Tabacuba		2.2		Local

Source: Made by the authors

Step 18. Analysis of partial correlation

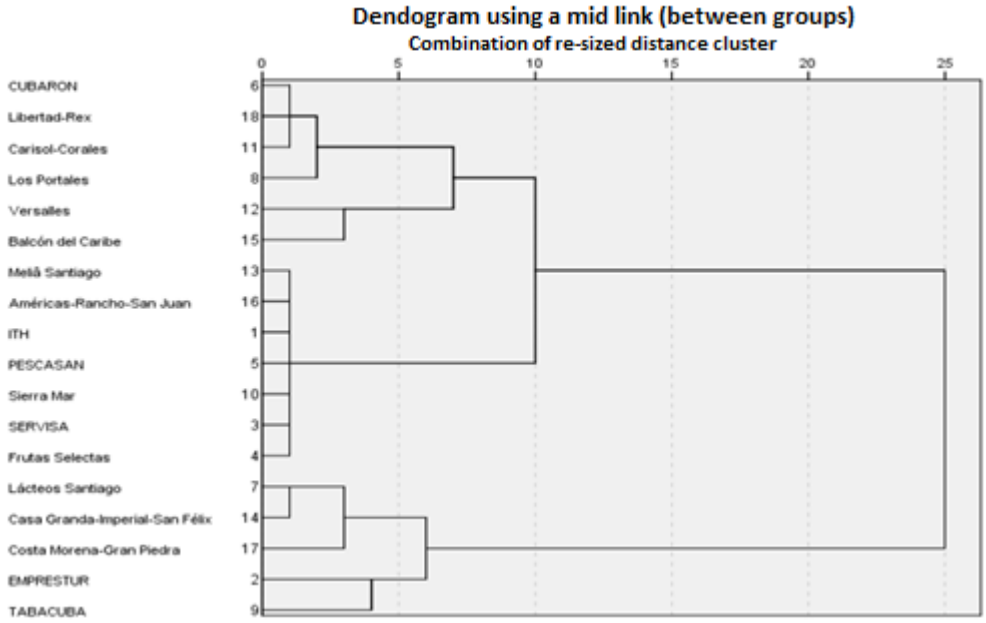
SPSS 22.0 was used to run partial correlation tests to the classified suppliers (Frutas Selectas, PECASAN, and Los Portales). The first two tests were satisfactory, with asymptotic significance below 0.05 (0.00 and 0.045), and partial inventory correlations of 1.0 and 0.799, respectively, in relation to the total Santiago de Cuba tourist destination, which evidenced conditions for the establishment of clusters. Although this situation does not guarantee the participation in chains, the likelihood of occurrence is significant.

Step 19. Cluster mapping

The results from steps 14, 15, and 16 were processed using SPSS, 22.0 to complement the test, through cluster analysis to determine the level of association of the companies studied, which could facilitate the detection of dynamic clusters or clusters in recession. In turn, the study might reveal entities less prone to form clusters, entities less inclined to welcome them, and others more susceptible to further studies to determine their potentials of incentives for the consolidation of weak clusters.

Fig. 2 shows a strong immediate association in the hotel group including Meliá, Sierra Mar and Las Américas Complex, inside suppliers (ITH and SERVISA) and the outside suppliers (PESCASAN and Frutas Selectas). The other clusters occurred slowly, creating differences between this group and the rest. Later, this group joined another consisting of Cuba Ron, the Libertad-Rex Hotel Complex, Cariso-Corales Hotel Complex, Los Portales Company, and the Balcon del Caribe Hotel. Then two groups stood out just following level 10, the one resulting from the above fusion, and the other made of Lacteos Santiago company, Casa Granda-Imperial Complex, Costa Morena-Gran Piedra Complex, EMPRESTUR, and Tabacuba.

It found clusters with a high level of interaction based on the empirical evidence, which permitted the authors to design a scheme of the possible cluster and the actors in it, as shown in Fig. 3.



Source: Visor of results provided by SPSS 22.0

Fig. 2 Cluster history of companies of the Santiago de Cuba tourist destination

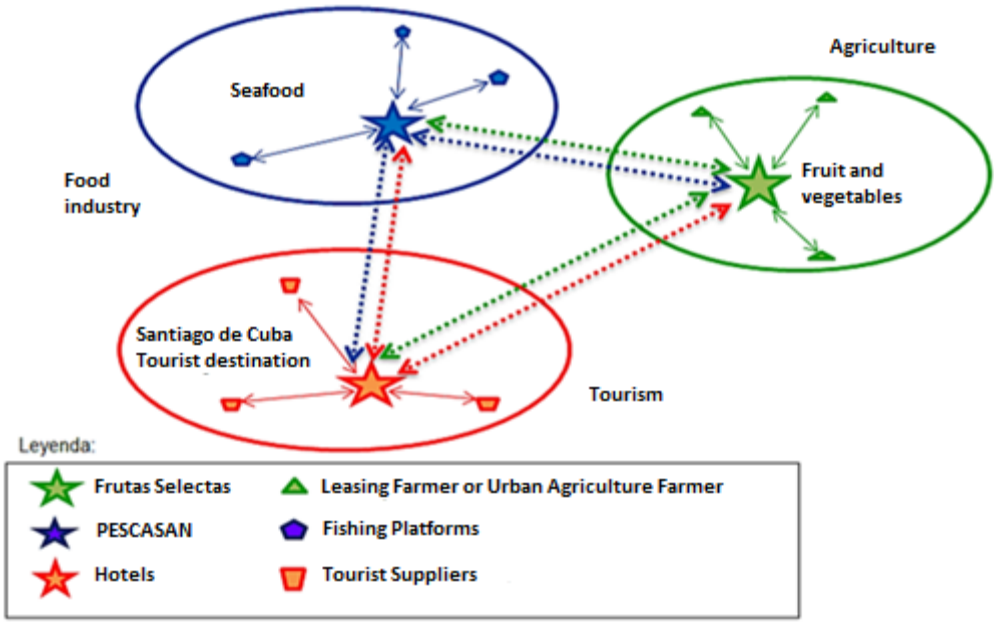


Fig.3 Diagram of the possible cluster

Phase 2. Adjustment of the input-output matrix (I-P)

Objective: To identify which hotel facility can dynamize the economy of the destination and which supplier will need to adapt to the requirements.

The I-P matrix is developed and implemented in global economic sectors; however, this research included an adjustment of the method to conduct a more detailed specific analysis. It performed a mini-company desegregation that permitted to single out the shortcomings or advantages of entities in the study within the territories. It relies on I-P elements and coefficients to build a system whose structure contributes with a mechanism to arrange and contrast economic data associated with exchange flows and commercial distribution in rows and columns.

Stage 5. Determination of the elements in the I-P matrix

Objective: To gather information about the production structure of the tourist destination in the period studied for classification and matching of inventory flows, with a balance between supply and demand.

Quadrant I

1. Intermediate consumption

$$CI = \sum_{i=1}^{n} X_{ij} \qquad (10)$$

Where:

CI: Intermediate consumption

X_{ij}: Items consumed in the j hotel from every supplier

i: Suppliers

n: Total of suppliers

2. Intermediate consumption

$$DI = \sum_{j=1}^{m} X_{ij} \qquad (11)$$

Where:

DI: Intermediate demand

X_{ij}: The items requested by every hotel from i supplier

j: Hotels

m: Total of hotels

Quadrant II

Final demand

$$DF = CF + FBK + X \qquad (12)$$

Where:

DF: Final demand

CF: Final consumption

FBK: Gross capital training

X: Exports

Total demand

$$DT = DI + DF \qquad (13)$$

Where:

DT: Total demand

Quadrant III

Total supply

$$OT = CI + F \qquad (14)$$

OT: Total items consumed in the j hotel from every i supplier

F: Sum of all the indicators from quadrant III of the matrix.

Step 20. Matrix of direct expense coefficients.

$$A = [a_{ij}] = \frac{X_{ij}}{X_i} \qquad (15)$$

Where:

A: Matrix of direct expense coefficients

a_{ij}: Direct expense coefficients

X_i: Total items consumed in the j hotel from every supplier

The scales from a_{ij} = 1, 2, 3… a_{im} of the matrix (by columns), mean that for the hotels to offer a service unit they need 0.1440; 0.1467; 0.1335; 0.5941; 0.1335; 0.1362;

0.1568; 0.1434, and 0.1247 pesos of inputs for production from ITH, respectively, as shown in the matrix, and successively for the other suppliers (Table 13).

Table 13 Matrix of direct expense coefficients

A	Sierra Mar	Carisol-Corales Complex	Versalles	Meliá Santiago	Casa Granda-Imperial Complex	Balcón del Caribe	Las Americas Complex	Costa Morena-GRan Piedra	Libertad-Rex Complex
ITH	0.1440	0.1467	0.1335	0.5941	0.1355	0.1362	0.1568	0.1434	0.1247
EMPRESTUR	0.1272	0.1415	0.1135	0.0555	0.1017	0.0961	0.1341	0.1049	0.0877
SERVISA	0.1190	0.1009	0.0428	0.0511	0.0971	0.0907	0.1050	0.0854	0.0979
Frutas Selectas	0.1101	0.1002	0.0911	0.0442	0.0739	0.1070	0.1215	0.1018	0.1096
PESCASAN	0.0925	0.0764	0.0697	0.0414	0.0840	0.0861	0.1133	0.0906	0.0899
Cuba Ron	0.0686	0.0774	0.1039	0.0545	0.1073	0.0823	0.1242	0.0767	0.0758
Lácteos Santiago	0.0382	0.0490	0.0126	0.0296	0.0697	0.0361	0.0292	0.0549	0.0375
Los Portales	0.0492	0.0521	0.1032	0.0324	0.0430	0.0664	0.0308	0.0652	0.0693
Tabacuba	0.0691	0.0631	0.1134	0.0417	0.0914	0.0765	0.0447	0.0761	0.0743

Source: Made by the authors

Step 21. Matrix of final demand.

$$[I - A] = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix} - A \quad (16)$$

Where:

$[I - A]$: Matrix of final demand (the Leontief matrix)

$\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$: Unitary or identity matrix

The sums of a_{ij} from the matrix were interpreted by rows and columns; the former mean that out of every service peso offered by hotels, the primary inputs paid to suppliers were 0.715, 0.038, 0.210, 0.141, 0.256, 0.229, 0.643, 0.488, and 0.350, respectively, whereas the latter represent every peso sold by the suppliers to hotels

left in the final demand 0.1821, 0.1928, 0.2163, 0.0555, 0.1965, 0.2226, 0.1405, 0.2011, and 0.2335, respectively (Table 14).

Table 14. Matrix of final demand.

I-A	Sierra Mar	Carisol-Corales Complex	Versalles	Meliá Santiago	Casa Granda-Imperial Complex	Balcón del Caribe	Las Americas Complex	Costa Morena-Gran Piedra Complex	Libertad-Rex Complex	Σ
ITH	0.856	-0.147	-0.133	-0.594	-0.136	-0.136	-0.157	-0.143	-0.125	-0.715
EMPRESTUR	-0.127	0.859	-0.114	-0.056	-0.102	-0.096	-0.134	-0.105	-0.088	0.038
SERVISA	-0.119	-0.101	0.957	-0.051	-0.097	-0.091	-0.105	-0.085	-0.098	0.210
Frutas Selectas	-0.110	-0.100	-0.091	0.956	-0.074	-0.107	-0.122	-0.102	-0.110	0.141
PESCASAN	-0.093	-0.076	-0.070	-0.041	0.916	-0.086	-0.113	-0.091	-0.090	0.256
Cuba Ron	-0.069	-0.077	-0.104	-0.054	-0.107	0.918	-0.124	-0.077	-0.076	0.229
Lácteos Santiago	-0.038	-0.049	-0.013	-0.030	-0.070	-0.036	0.971	-0.055	-0.037	0.643
Los Portales	-0.049	-0.052	-0.103	-0.032	-0.043	-0.066	-0.031	0.935	-0.069	0.488
Tabacuba	-0.069	-0.063	-0.113	-0.042	-0.091	-0.077	-0.045	-0.076	0.926	0.350
Σ	0.1821	0.1928	0.2163	0.0555	0.1965	0.2226	0.1405	0.2011	0.2335	

Source: Made by the authors

Step 22. Matrix of total expenses

$$B = [I - A]^{-1} \quad (17)$$

Where:

B: Matrix of total expenses (Leontief inverse)

This step includes two analyses, one refers to inferences of the matrix of total expenses, which were oriented in two senses: explanation of sums by rows and columns of the matrix, where the former represent the forward chains, which determined that PESCASAN will have to adjust their production capacities to the final demands of the destination, in order to integrate the cluster. The former

constitutes the expression of reverse chains, which determined that the hotel with the best conditions to stimulate the Santiago de Cuba tourist destination is Melia Santiago. The second analysis was based on the interpretation of scalars, from B_{ij} = 1, 2, 3… B_n of the matrix (by rows), which express the requirements of total expenses to satisfy a unit of final demand, as shown below. B_{11}-B_{91}: It requires 1.0077, 0.0824, 0.0191, 0.0191,0.0437, 0.0986, 0.0349, 0.0473, 0.1015 pesos in total expenses from ITH, EMPRESTUR, SERVISA, Frutas Selectas, PESCASAN, Cuba Ron, Lacteos Santiago, Los Portales, and Tabacuba, respectively, to satisfy a unit of final demand of the inventory of Sierra Maestra hotel, and successively for the other hotels (Table 15).

Table 15. Matrix total expenses

(I-A) - [1]	**Sierra Mar**	**Complejo Carisol-Corrales**	**Versalles**	**Meliá Santiago**	**Casa Granda-Imperial Complex**	**Balcón del Caribe**	**Las Americas Complex**	**Costa Morena-GRan Piedra Complex**	**Libertad-Rex Complex**	**Σ**
ITH	1.0077	0.0057	0.0036	0.0542	0.0606	0.0021	0.0088	0.0034	0.0015	1.4177
EMPRESTUR	0.0824	1.0243	0.0054	0.1089	0.0662	0.0035	0.0376	0.0055	0.0027	1.3364
SERVISA	0.0191	0.0120	1.0053	0.1322	0.1116	0.0041	0.0155	0.0063	0.0034	1.3096
Frutas Selectas	0.0191	0.0180	0.0073	1.1010	0.0361	0.0054	0.0215	0.0155	0.0047	1.2284
PESCASAN	0.0437	0.0096	0.0073	0.0500	1.0356	0.0027	0.0104	0.0049	0.0023	1.1666
Cuba Ron	0.0986	0.0885	0.0078	0.8499	0.0782	1.0059	0.0150	0.0929	0.0064	2.2430
Lácteos Santiago	0.0349	0.0172	0.0088	0.0313	0.0134	0.0054	1.0193	0.0057	0.0056	1.1416
Los Portales	0.0473	0.0416	0.0079	0.0439	0.0411	0.0058	0.0349	1.0073	0.0052	1.2349
Tabacuba	0.1015	0.0127	0.0055	0.0478	0.1671	0.0071	0.0123	0.0094	1.0052	1.3685
Σ	1.4541	1.2295	1.0589	2.4191	1.6098	1.0418	1.1753	1.1508	1.0372	

Source: Made by the authors

CONCLUSIONS

Upon finalizing the procedure, it can be concluded that the Santiago de Cuba tourist destination meets the conditions to be part of production chains, which is justified by the following results:

1. Although the suppliers with the greatest business activity are inside the sector (ITH, SERVISA, and EMPRESTUR), noteworthy contributions from outside contributors were observed, such as Frutas Selectas, and PESCASAN.
2. The analysis of the total expense matrix demonstrated that though ITH is the top supplier in tourism, and that there is still a poor utilization of the production capacities of the territory, which was corroborated through a meager association with outside suppliers.
3. The empirical evidence provided by cluster mapping showed that due to the high level of interaction Frutas Selectas and PESCASAN were the outside suppliers with the best potentialities to become part of production chains in the destination.
4. The application of the matrix of total expenses (Leontief inverse), permitted the identification of the Melia Santiago Hotel with the best conditions to stimulate the destination in the province, together with PESCASAN, as the supplying entity with the potential to meet the local demands, though their production capacities should be adjusted to the demands.

REFERENCES

Alburquerque, F. (2006). Clúster, territorio y desarrollo empresarial: diferentes modelos de organización productiva. Cuarto Taller de la Red de Proyectos de Integración Productiva. Fondo Multilateral de Inversiones (MIF/FOMIN). Banco Interamericano de Desarrollo. San José, Costa Rica,

Correa, E. M. (2018). Las cadenas productivas del turismo de naturaleza en la organización de la producción territorial (Tesis Doctoral). Universidad de Camagüey, Camagüey, Cuba

Hirschman, A. (1958). The Strategy of Economic Development Ciudad de México, México: Fondo de Cultura Económica

Isaza, J. G. (2009). Cadenas productivas. Enfoques y precisiones conceptuales. *Revista Investigación*, (4), 8-25.

Lira, L. y Quiroga, B. (2009). Técnicas de análisis regional. Retrieved from https://repositorio.cepal.org/handle/11362/5500.

Leontief, W. (1936). Quantitative Input-Output relations in the economic system of the United States. Review of Economics and Statistics, 18(3), 105-125. Retrieved from https://www.jstor.org/stable/1927837

Madruga, A. (2015). *Aglomeraciones productivas como base para los sistemas productivos locales* (Tesis Doctoral). Facultad de Ciencias Económicas, Centro de Estudios de Dirección Empresarial y Territorial, Universidad de Camagüey, Cuba.

PCC (Partido Comunista de Cuba). (2016). Conceptualización del modelo económico y social cubano de desarrollo socialista. Plan Nacional de desarrollo económico y social hasta el 2030: Propuesta de visión de la nación, ejes y sectores estratégicos. La Habana: Autor.

Pérez, R *et al*. (2013). *"Compendio de Métodos, Técnicas e Instrumentos de planificación".* La Habana, Cuba.

Porter, M. E. (1998). Clúster and the New Economics of Competition. Harvard Business Review, 6(76). Retrieved from https://hbr.org/1998/11/clusters-and-the-new-economics-of-competition

Conflict of interest and conflict of ethics statement

The authors declare that this manuscript is original, ans has not been submitted to another journal. This article is part of the results of a doctorate training, so all the authors are responsible for the contents published in it. It contains no plagiarism, conflicts of interest, or ethical conflicts. The journal is exempted from any ethical or legal commitment, or both.

Author contribution

Javier Díaz Pozo. Conceptualization – idea, formal analysis, research, visualization, redaction original manuscript, proof-reading.

Graciela María Castellanos Pallerols. Conceptualization – idea, redaction original manuscript, proof-reading.

Norma Rafaela Hernández Domínguez. Conceptualization – idea, redaction original manuscript, proof-reading.

Rosario León Robaina. Conceptualization – idea, visualization, redaction original manuscript, proof-reading.