SUSTAINABILITY IN PUBLIC POLICIES FOR LOCAL MANAGEMENT OF TOURISM IN COZUMEL, MEXICO

Sustentabilidade nas Políticas Públicas para a Gestão Local do Turismo em Cozumel, México

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ABSTRACT

In local management, sustainability depends not only on the condition of the environment but also on the complex interrelationships among stakeholders. This research has used Graph Theory (GT) to create network graphs, which allows calculating indicators to obtain the most influential node; among nodes representing the classification of texts and stakeholders obtained from public-hearings minutes from 2002 to 2016 in Cozumel, Mexico. First, public actions have been classified into categories; next, subcategories; and finally, related to the Sustainable Development Goals (SDGs). Subsequently, a Text Network Analysis (TNA) and Social Network Analysis (SNA) were made using UCINET and NetDraw software to find the most promoted SDG and the influence of stakeholders in promoting SDGs. The result shows that SDG 11 is the most crucial node and has the highest degree of centrality due to the promotion of tourism as the main economic activity; and that the public sector dominates the decision-making process. These findings helped to elucidate the structure of the networks, highlighting that the exercise of sustainability is asymmetric, and it is necessary to promote all SDGs equivalently in local management.

KEYWORDS

Tourism; Public Policies; Management; Sustainable Development Goals; Cozumel, Mexico.

RESUMO

Na gestão local, a sustentabilidade depende não somente das condições do meio ambiente, mas também das complexas inter-relações entre stakeholders. Esta pesquisa utilizou a Teoria dos Grafos (TG) para criar gráficos de rede, permitindo calcular indicadores para obter o nó mais influente; entre os nós que representam a classificação de textos e stakeholders extraídos de atas de audiência pública de 2002 a 2016 em Cozumel, México. Primeiro, as ações públicas foram classificadas em categorias; depois, subcategorias; e, finalmente, relacionadas aos Objetivos de Desenvolvimento Sustentável (ODS). Posteriormente, uma Análise de Redes de Texto (TNA) e uma Análise de Redes Sociais (SNA) foram realizadas através dos softwares UCINET e NetDraw para encontrar os ODS mais promovidos e a influência dos stakeholders na promoção dos ODS.

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O resultado revela que o ODS 11 é o nó mais crucial e que possui o mais alto grau de centralidade devido à promoção do turismo como principal atividade econômica; e que o setor público domina o processo de tomada de decisões. Estas descobertas ajudaram a elucidar a estrutura das redes, destacando que o exercício da sustentabilidade é assimétrico e que é necessário promover todos os ODS de modo equivalente na gestão local.

PALAVRAS-CHAVE

Turismo; Políticas Públicas; Gestão; Metas do Desenvolvimento Sustentável; Cozumel, Mexico.

INTRODUCTION

Sustainability and local management are currently promoted through transnational precepts such as Agenda 21 and Agenda 2030 (León Abarca & Reyes Vargas, 2020). These agendas have become relevant for policy makers to achieve sustainability. In this context, sustainability acquires relevance in public policies. For this, Mexico's government adopted it through the National Tourism Plan [NTP] since 2001, and Cozumel has been the first tourist destination to have implemented Agenda 21 and Agenda 2030, which currently encourages sustainability through 17 Sustainable Development Goals [SDGs'] to be achieved before 2030 (Vilchis Onofre & Palafox Muñoz, 2019). Tourism is the main economic activity in the city of Cozumel; however, it has had negative environmental, social, and cultural impacts. The principles of sustainability have been included in policy-making to minimize adverse effects and encourage development oriented to the needs of citizens (Muñoz Aréyzaga, 2019). Addressing the GT in tourist destinations allows us to visualize the incidence of the Agendas and SDGs' in policy-making and their impacts.

DEVELOPMENT

Theoretical framework: Graph Theory [GT] - GT is the study of mathematical structures that are used to model pairwise relationships between objects of a given corpus. It has a wide range of applications in computer science, engineering, social science, linguistics, cryptography, life science, medical science, chemical science, and engineering. Basically, a graph is a structure that consists of a set of nodes interconnected by links and allows the modeling of various situations where it is required to represent relationships between a set of elements. These structures are useful since it is possible to apply on them a wide variety of algorithms for graphs, and those results can help facilitate the analysis and resolution of different problems associated with the

situations they model (Mamani & Martins, 2020). They have applications in Text Network Analysis [TNA] and Social Network Analysis [SNA] (Celardo & Everett, 2019).

The essential elements that constitute a network are the nodes and their relationships represented by links. The network structure defines limitations, opportunities, and interactions between the nodes (Serrat, 2017). In this study, GT approach has been used for text analysis, assuming that the links between nodes has an effect on the application of SDGs' in decision-making process. Therefore, it is necessary to analyze the relationship with SDGs' and specific attributes of network structure; in this way, it contributes to achieving sustainability (Victor & Khwaja, 2020).

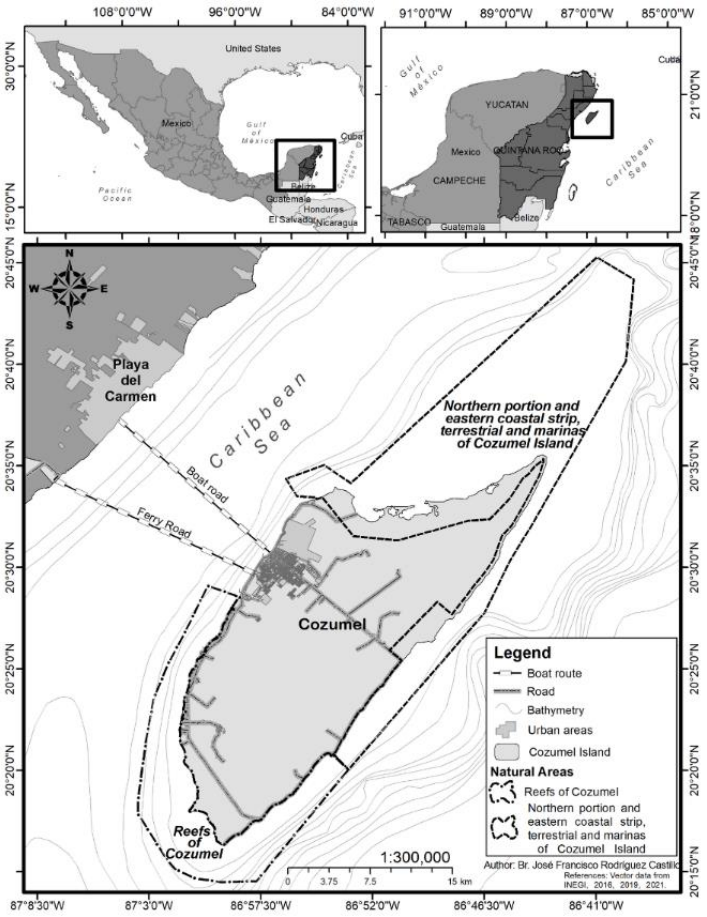
Although local management leads to democratic spaces and greater citizen participation, current management operates within a framework of asymmetric power relations determined by economic power, which in some cases is legitimized by government power. When this occurs, the potential of civil society is restricted, and citizen participation only serves to legitimize government actions. Some of the consequences of this inequity produced in local management are the dissociation in urban areas, support towns or excluded workers reflected at the local level, functional and morphological heterogeneity, urban and ecotourism occupation patterns; isolated and punctual tourism, struggle for rights, local confrontations and spatial inequality (Vázquez Sosa et al. 2020; Jouault & García de Fuentes, 2020).

Addressing the local management of sustainable tourism from the approach of GT allows to visualize the incidence of the sectors in the production of public policies and their impacts in promoting the sustainability of the destination. The analysis of the minutes is essential since the collegiate body makes decisions by consensus and is directed by the municipal government (Cruz Jiménez, 2018). This suggests the need to understand better the issues that take part of the negotiation in the meetings. These meetings are arenas defined as critical sites where actors come together to negotiate policies or promote organizational goals. According to the objectives of the research, several techniques can be used to analyze and classify the content of the text. Implementing a text co-occurrences procedure for automatic content classification the TNA will be used. The idea is that using a relational model based on the public actions where they are classified into categories and subcategories from minutes, we can obtain a better understanding of the SDGs' promoted inside the local management. One of the main findings is that there is a need for a new participatory culture to design inclusive public policies in the city.

Case study - The research area of this study is the island and municipality of Cozumel, which is located in the Caribbean Sea off the eastern coast of Mexico's Yucatan Peninsula, opposite Playa del Carmen; it is also part of the state of Quintana Roo, Mexico [Fig.1]. The development of Cozumel is based on tourism with the following market segments: diving and cruise tourism. Its development brought with it negative impacts that have been recognizable; these include the destruction of reefs, the degradation of habitats, high demand for fresh water, importation of non-native flora and fauna, loss of biodiversity, infrastructure overload [unable to meet the needs of citizens and tourists], loss of productive capacity in a non-tourist offer, exclusion from the community, cultural conflicts, migration, residential segregation, social gaps, loss of communal recreational spaces, crowding of people and traffic congestion (Segrado, Palafox Muñoz, & Arroyo, 2008).

From the National Tourism Program for 2001-2006, sustainability is integrated as part of development strategies. As a result, there has been included the citizen participation in local management, considering the inclusion in decision-making of: citizen and non-government organizations considered as social sector, local business sector, construction companies and companies in the tourism as private sector and local government and political actors as public sector. Promoting sustainable development has been taken to minimize the negative impacts of tourist activity; however, natural resources are already being rationalized, generating an increase in them, inequality and poverty continue to advance, leaving the fate of residents to the will of businessmen decisions foreigners, regional partners, and local authorities (Palafox Muñoz & Rubí González, 2019?). It is evident that the focus of the policies for the transformation of the landscape has been for the benefit of tourism, a clear example of this is the creation of port infrastructure. In this way, the creation of infrastructure for tourism develops an economic value, turning it into private infrastructure without social benefit (Palafox Muñoz et al., 2015).

Figure 1. Location of Cozumel, Mexico



Note. Recovered from INEGI (2017).

METHODOLOGY

This study is based on a unique longitudinal and integrated case (Yin, 2009) based on the implementation phase of Agenda 21 and Agenda 2030 from 2001 to 2016. These agendas are part now of the SDGs', based on a multilateral agreement created at the 1992 UN Summit in Rio de Janeiro that includes the Climate Change and Poverty agreements. The SDGs' are seen as a breakthrough in policy-making, combining concern for the environment with a commitment to addressing the needs of citizens. Local governments in Mexico are called municipalities, which make up the city-state. Cozumel is the most crucial structure of decentralized power, and the competence of the local government is to satisfy the primary needs of local communities, providing basic social and technical services, including spatial planning tasks. In the area of local

affairs, the local government is complemented by the state and federal governments, responsible for the affairs of the country.

Our unit of analysis are the meetings called by the municipalities to negotiate public policy issues since they are the crucial spaces where participants debate, reach agreements and "provide opportunities for researchers to observe and document policy-making processes as they develop through time" (Corson, Campbell, & MacDonald, 2014, p. 34). This will allow us to identify the public actions that are debated in meetings [these public actions refer to the demands]. The investigation is designed in two stages: first, a text analysis of the council meetings was carried out, the public actions that were part of the decision-making process were identified and classified. Also, there were identified the sectors that take part of the decision-making process. The second stage consists in the elaboration of a network map with the UCINET and NETDRAW software where the following is expressed: (1) the relationship between the public actions and their classification (2) the relationship between the classification of public actions and SGD's, (3) the relationship between the classifications and SDGs' with municipal periods; and, finally (4) the relationship between the SDGs' with sectors.

Phase 1 - The collegiate body is made up of political leaders who represent the citizens and hold meetings to reach agreements on political actions to correct the city's problems. At these meetings, the agreements are signed and filed. Four hundred and forty-six municipal meetings corresponding to five municipal periods were analyzed (Table 1). These periods indicate the duration of the mandate in the municipalities and they are approximately three years. There are two types of meetings: ordinary and extraordinary (the latter are meetings that deal with specific topics outside of the regular meetings). As a result, 2,311 public actions were obtained, considered as topics debated in the meetings of the collegiate body and 1,966 are directly related with SDGs'.

Table 1. Number of meetings by municipal period

Municipal Period	Ordinary meetings	Extraordinary meetings	Public actions
2002-2005	72	12	587
2005-2008	70	28	783
2008-2011	71	31	423
2011-2013	62		353
2013-2016	73	27	165
Total	**348**	**98**	**2311**

Note. Elaboration based on MGC, 2018.

The categories were assigned in relation to the powers and obligations of the local government indicated by the Municipalities Law of the State of Quintana Roo in art. 66 (SEGOB; INAFED, 2018; CEQROO, 2017):

- Legal agenda - It refers to the power in government and internal regime matters, such as the issuance of licenses and permits. This point occupies a significant part of the agenda, which is striking.

- Political agenda – It refers to issues directly related to the political activity carried out in the council.

- Administrative agenda - It is the traditional agenda of the municipality, which corresponds to regulations, rules, among other matters that should not take up much time; however, the number????? of administrative actions that are attended in the council is considered significant.

- Municipal development agenda - It includes issues that are not part of the responsibilities of the municipalities but contribute to integral development. It is made up of topics related to urban development (such as plans, projects and studies); social development (like social assistance and attention to vulnerable groups); and economic development (for instance municipal economic development, tourism, and employment). Thus, the municipal development agenda marks an essential moment in the transition from a service provider municipality to a policy-maker for the comprehensive development of the municipality.

- Municipal services agenda - It is the service provider agency that addresses the issues arising from the responsibilities assigned to the municipal order. This is the agenda that brings the municipal government closer to a service provider agency; it could say that it is the traditional agenda of a municipal administration.

- Non-municipal services agenda - They are those actions that result from the pressure of the citizens, initiatives of the municipal government itself, and even its complementary participation with another hierarchy of the government; they are not part of the responsibilities attributed to the municipality.

The subcategories that make up the categories are 46 and specify the topics that correspond to each category and their relationship with the SDGs' (Table 2). It should be noted that the SDGs'

were related to the issues according to the goals that make up each of them. The subcategories 'Human resources administration' and 'Material Resources' were not related with SDGs' because the first one involves the personal who works in the municipal government, and the second one involves documents that are filed. The subcategory 'Good government sides' involves initiatives from the municipal government to regulate relationships between the authority and the citizens through rules.

Table 2. Categories and subcategories to analyze council meeting minutes

CATEGORY	SUBCATEGORY	SDGs'
Legal Agenda	Regulations	16
	Rules	16
	Good government sides	16
	Law Analysis	16
	Issuance of licenses and permits	16
Political Agenda	Relations with the municipal government and the community	17
	Relations with political parties and state congress	17
	Coordination with the state and federal government	17
	Public relations	16
	Disclosure and media	16
Administrative Agenda	Human resources administration	
	Treasury and finance	17
	Material resources	
Municipal Development Agenda	Plans, projects and studies	11
	Urban administration of territory and land use	11
	Urban infrastructure	11
	Social infrastructure	11
	Citizen participation programs	11
	Social Assistance	11
	Attention to vulnerable groups	10
	Municipal economic development	8
	Tourism	8
	Employment	8
Municipal Services Agenda	Drinking Water	6
	Drainage and sewer	6
	Solid waste	12
	Electrification	7
	Public markets	2
	Parks and gardens	11
	Pantheons	11
	Public lighting	7
	Public safety	16
	Trail	2
	Cleaning	11
	Streets	11
	Education	4

Non municipal Services Agenda	Health	3
	House	11
	Environment	11
	Culture	11
	Sport	11
	Animal Control	15

Note*.* Elaboration based on SEGOB; INAFED, 2018; CEQROO, 2017.

There is a relationship between the Millennium Development Goals ([MDGs'] promoted in Agenda 21 and the SDGs' promoted in Agenda 2030 [Table 3].

Table 3. Relationship between MDGs' and the SDGs'

MDG		SDG	
Eradicate extreme poverty and hunger.	1	Eradicate poverty in all its forms throughout the world.	1
		End hunger, achieve food security and better nutrition, and promote sustainable agriculture.	2
		Promote sustained, inclusive and sustainable economic growth, employment full and productive, and decent work for all.	8
		Develop resilient infrastructure, promote inclusive industrialization and sustainable, and encourage innovation.	9
Achieve universal primary education	2	Guarantee an inclusive and equitable quality education, and promote the lifelong learning opportunities for all.	4
Promote gender equality and women's autonomy.	3	Achieve gender equality and empower all women and girls.	5
Reduce infant mortality.	4	Guarantee a healthy life and promote well-being for everyone in all ages.	3
To improve maternal health.	5		
Fight HIV/AIDS, malaria and other diseases.	6		
Guarantee environmental sustainability.	7	Make cities and human settlements inclusive, safe, resilient and sustainable.	11
		Ensuring the availability and sustainable management of water and sanitation for all.	6
		Ensure access to affordable, reliable, sustainable and modern energy for everybody.	7
		Guarantee sustainable consumption and production patterns.	12
		Take urgent action to combat climate change and its effects.	13
		Conserve and sustainably use the oceans, seas and marine resources to achieve sustainable development.	14
		Protect, restore and promote the sustainable use of ecosystems land, sustainably manage forests, combat desertification and halt and reverse land degradation, and halt the lost of biological diversity.	15
Promote a world association for development	8	Strengthen the means of implementation and revive the global partnership for sustainable development.	17

Note*.* Elaboration based on UN (2015).

Also, there are differences, firstly the SDG 16, related with 'Strengthen the means of implementation and revive the global partnership for sustainable development', in this goal it is promoted the 'Good governance', which is focused on promoting the rule of law, equal access to justice, transparency and accountability, participation in decision-making, and the fight against corruption and illicit financial and arms flows. The second difference is about the SDG 10 'Reduce inequalities between countries and within them' in which the suppression of discriminatory laws and the adoption of fiscal, salary and social protection policies are demanded; and at the international level, greater development aid efforts, better regulation of financial markets and democratization, with more voice and greater representation, of international organizations.

Afterward, the sectors were identified through text analysis of minutes (Jae, 2021), and they were classified by sectors: private, public, and social; by municipal period and by direction of participation. The sectors who request the demands are sources of information [in-degree index], and the sectors who receive the information are intermediaries of social issues [out-degree index]. In this way, speech acts are obtained from meetings, where the listener is the collegiate body, and the speaker is the sector who demands public action (Corredor, 2020). The analysis of the text reveals the sector that have intervened in the decision-making process in Cozumel, in order to identify the most influential.

Phase 2 - To evaluate the level of activity of SDGs', we used several network-level centrality metrics: network density, degree of centralization and average degree (Sapountzi & Psannis, 2018). Network density represents the proportion of observed connections between nodes to the maximum number of possible connections and reflects the degree of interconnectivity between nodes (Aguilar Gallegos, Martínez González, & Aguilar Ávila, 2017). The degree centralization measures to what extent the connections are centralized around some nodes, representing the degree of variance in the network as a percentage of that of a 'star' network [all nodes connected only to a central node] of the same size (Brass & Borgatti, 2020). The centrality metrics allow us to infer which case study presents a more cohesive pattern, ensuring a high level of interaction between the nodes and an efficient information Flow (Borgatti et al., 2019).

RESULTS

Phase 1 - In the first phase we identified the public actions and they were classified into agendas [Table 4]. The categories that occupy a significant percentage of attention are the administrative agenda (31%), municipal services (24%), and the municipal development agenda (19%). Also, we identify 57 actors from private sector, 139 actors from public sector and 48 actors from social sector.

Table 4. Co-occurrences of agendas in public actions

Agenda	Co-occurrences	Percent of the total of public actions
Administrative Agenda	708	31 %
Municipal Services Agenda	553	24 %
Municipal Development Agenda	441	19 %
Legal Agenda	369	16 %
Non municipal services Agenda	162	7 %
Political Agenda	78	3 %

Note. Elaboration based on MGC (2018).

For the 'Administrative Agenda', most addressed topics correspond to the 'Treasury and Finance' subcategory, emphasizing the collection of taxes, loans, and budget management [Table 5]. For 'Municipal Services', the issues most tackled are those corresponding to the 'Public Security' subcategory, in particular regarding the attention service; they also attend to specific problems of 'Streets', among the most attended are those in the downtown area, as well as 'Cleaning' and garbage collection [Solid Waste].

Table 5. Co-occurrences of subcategories in agendas

Agenda	Subcategory	Co-occurrences
Administrative Agenda	Treasury and finance	359
	Human resources	199
	Material recourses	146
Municipal Services Agenda	Public safety	199
	Streets	160
	Cleaning	54
Municipal Development Agenda	Plans, projects and studies	133
	Urban Administration and Land Uses	79
	Urban Infrastructure	41
Legal Agenda	Rules	164
	Licenses and permits	140
	Laws	60

Note. Elaboration based on MGC, 2018.

For the 'Municipal Development Agenda', the subcategory most frequently is 'Plans, Projects and Studies', which correspond to federal, state, and municipal intervention resources, primarily focusing on improving tourism and citizen's infrastructure and services. In second place is the subcategory of 'Urban Administration and Land Uses', specifically for the use of commercial land for the sale of alcohol and the donation of land; lastly, 'Urban Infrastructure', which addresses the improvement of essential services.

In the 'Legal Agenda', mention is made of the analysis and creation of 'Regulations' at the municipal level, as well as the 'Issuance of Licenses and Permits" regarding construction and operation for commercial premises; ultimately, there is the 'Analysis of Laws', which the State Congress dictates.

Phase 2 – (1) The relationship between the public actions and their classification - First, we assessed the diameter, density and average degree of the network. The network has 52 nodes, with 48 links. From that, a density of 0.87 (8.7%) is estimated for the network, and an average degree of 40.95. This indicates that the connections are centralized around a few agendas since we have 8.7% (density) of possible links. It also tells us that the agendas have 40.95 (average degree) average links.

Degree Centrality - Centrality is the number of links to or from a particular node. In directed networks, it is important to distinguish between the centrality of the input degree and the output degree, which alludes to how a relationship is commonly perceived; in other words, when node "x" [agenda] reported a public action from node "y" [subcategories]. It is possible to obtain a centralization index related to the centrality of both in-degree and out-degree. So, a high index of network centralization based on degrees of entry would indicate that there is one or various nodes that are important as subcategories; if centralization is low, it means that there are no important subcategories.

On the other hand, a high index of centralization of the network based on degrees of output would indicate that there are nodes important as agendas; conversely, if the centralization index is low, it would indicate that there are no important agendas. The 'Municipal Services Agenda' has the most critical value for the out-degree index [Table 6], and the 'Electrification' has an irrelevant in-degree index, which means that this subcategory is the less frequently approached. In total, network centralization for outdegree is 3.099% and for indegree 1.925% and the variance is 0.526 for outdegree and 0.153 for indegree, which indicates that there is a significant

difference between the agendas. We also obtain the average degree, which indicates that all nodes [network size=52 nodes] have 40.958 links.

Table 6. In-degree and out-degree for agendas and subcategories

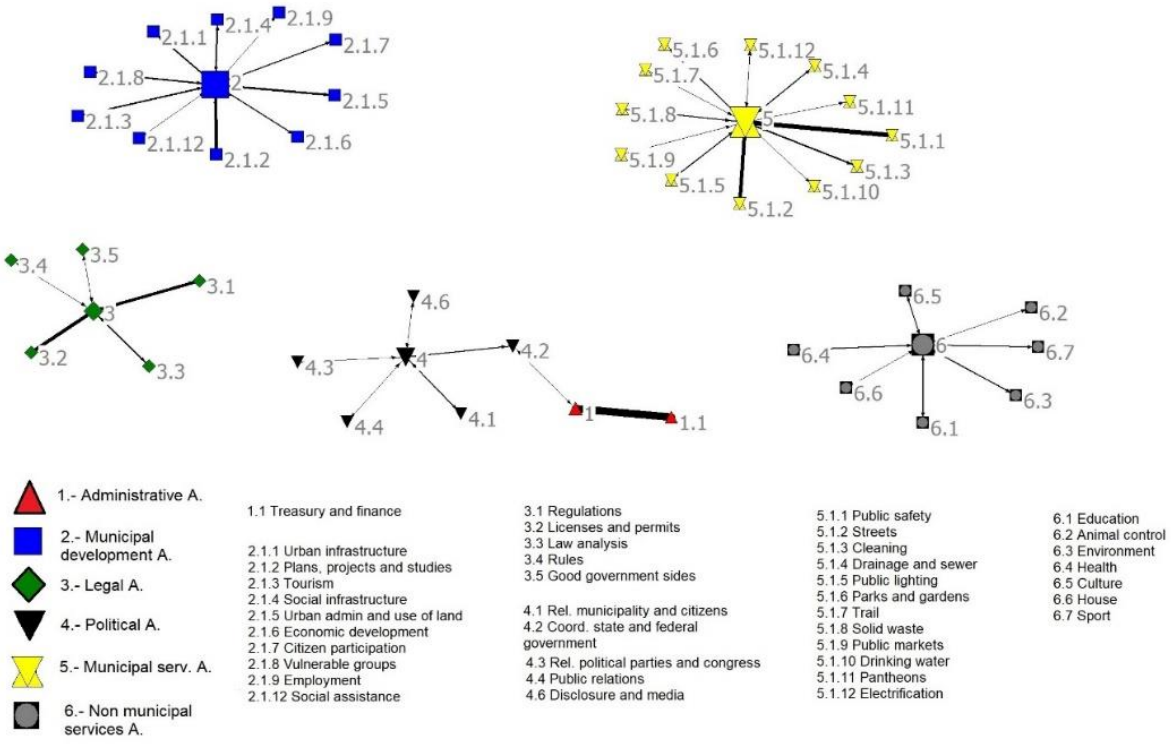
ID	OutDeg	Indeg
Municipal Services A.	3.277	
Municipal Development A.	2.608	
Legal A.	2.193	
Administrative A.	2.145	
Non municipal services A.	0.960	
Political A.	0.468	
Treasury and finance		2.128
Public safety		1.179
Licenses and permits		0.972
Streets		0.948
Regulations		0.830
Plans, projects and studies		0.788
Urban admin and land use		0.468
Law Analysis		0.356
Cleaning		0.320
Education		0.273
Electrification		0.006
	DESCRIPTIVE STATISTICS	
	OutDeg	**Indeg**
Mean	0.243	0.243
Std Dev	0.726	0.391
Sum	11.652	11.652
Variance	0.526	0.153
Minimum	0	0
Maximum	3.277	2.128
N of Obs	48	48
	Network Centralization (Outdegree)	3.099%
	Network Centralization (Indegree)	1.925%
	Average Degree	40.958

Note. Elaboration with UCINET based on MGC (2018).

The representation of networks can be expressed in graphs, the first graph represents the degree centrality [Fig. 2], where the most influential node is the biggest, which corresponds to the 'Municipal Services Agenda' [output degree]. Within the generation of network data, it is considered that the frequency of the interventions is equal to the intensity of the links that the

nodes have, which can be represented by the thickness of the links between the nodes. The most important link is the subcategory related to the 'Treasury and Finance' [input degree].

Figure 2. Network graph related to degree centrality of the agendas and subcategories



Note. Elaboration with NETDRAW based on MGC (2018).

The relationship between the classification of public actions and SGDs' - The network has 54 nodes, with 41 links. There is a density of 0.687 (6.8%), and an average degree of 36.407. This indicates that the connections are centralized around a few SDGs' since we have 6.8% (density) of possible links. It also tells us that the agendas have 36.407 (average degree) average links.

'Treasury and Finance' has the most critical value for the out-degree index [Table 7], and the SDG 11 has the main in-degree index, which means that those are the most frequently approached. In total, network centralization for outdegree is 1.727% and for indegree 3.334% and the variance is 0.111 for outdegree and 0.459 for indegree, which indicates that there is a significant difference between the SDGs'. We also obtain the average degree, which indicates that all nodes (network size=54 nodes) have 36.406 links.

Table 7. The relationship between the subcategories and SDGs'

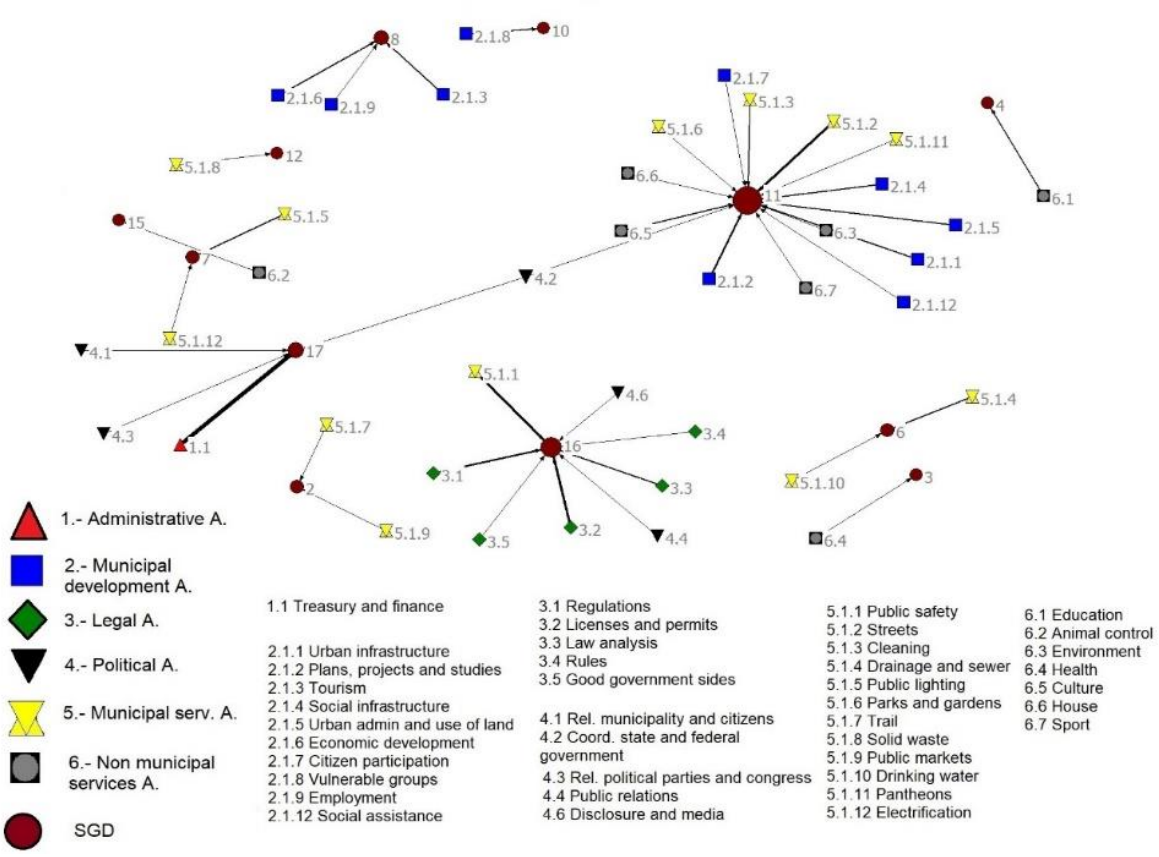
ID	OutDeg	Indeg
Treasury and finance	1.887	

Public safety	1.046		
Licenses and permits	0.841		
Streets	0.736		
Regulations	0.699		
Plans, projects and studies	0.415		
SDG 11			3.463
SDG 16			3.111
SDG 17			2.165
SDG 8			0.436
SDG 4			0.242
SDG 10			0.210
SDG 7			0.184
SDG 6			0.179
SDG 3			0.110
SDG 2			0.095
SDG 12			0.079
SDG 15			0.058
DESCRIPTIVE STATISTICS			
	OutDeg		**Indeg**
Mean	0.191		0.191
Std Dev	0.333		0.677
Sum	10.333		10.333
Variance	0.111		0.459
Minimum	0		0
Maximum	1.887		3.463
N of Obs	54		54
Network Centralization (Outdegree)		1.727%	
Network Centralization (Indegree)		3.334%	
Average Degree		36.407	

Note. Elaboration with UCINET based on MGC, 2018.

The second graph represents the degree centrality of the subcategories and SDGs' [Figure 3], where the most influential node is the biggest, which corresponds to the SDG 11 [output degree]. The most important link is the subcategory related to the 'Treasury and Finance' [input degree]; despite belonging to a not very relevant agenda, this subcategory represents a significant co-occurrence in terms of mention in public hearings.

Figure 3. Network graph related to degree centrality of the subcategories and SDGs'



Note. Elaboration with NETDRAW based on MGC (2018).

The relationship between the classifications and SDGs' with municipal periods - The relationship between the agendas and municipal periods - The network has 13 nodes, with 30 links. There is a density of 0.192 (19.2%), and an average degree of 2.308. This indicates that there is a distributed network since we have 19.2% (density) of possible links. In this case, there is not a most critical value for the out-degree index [Table 8], nor in-degree index, which means that the agendas are almost perfectly distributed in all municipal periods. In total, network centralization for outdegree is 33.33% and for indegree 24.306% and the variance is 591.716 for outdegree and 41.667 for indegree, which indicates that in municipal periods, there is a mention of all agendas. We also obtain the average degree, which indicates that all nodes (network size=13 nodes) have 2.308 links.

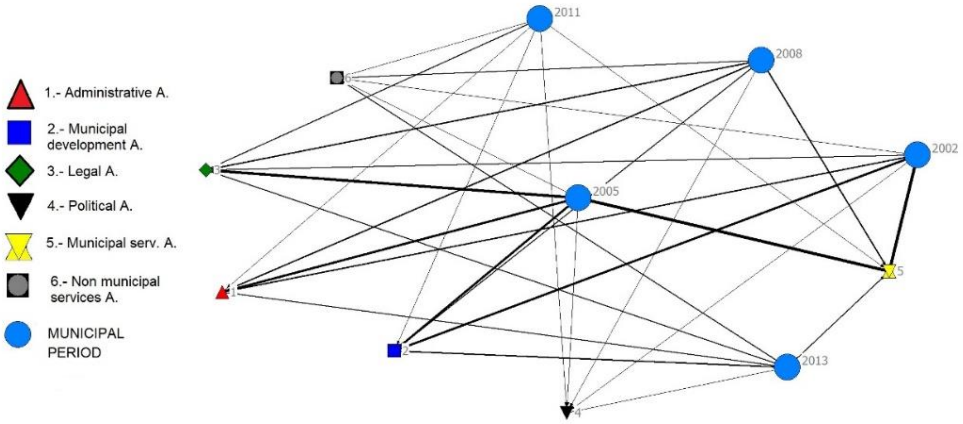
Table 8. The relationship between the periods and agendas

ID	OutDeg		Indeg
2005	**50**		
2002	50		
2008	**50**		
2013	50		
2011	**50**		
Municipal services A.			41.667
Municipal development A.			**41.667**
Legal A.			41.667
Administrative A.			**41.667**
Non municipal A.			41.667
Political A.			**41.667**
DESCRIPTIVE STATISTICS			
	OutDeg		**Indeg**
Mean	19.231		19.231
Std Dev	**24.325**		**20.772**
Sum	250		250
Variance	**591.716**		**431.46**
Minimum	0		0
Maximum	**50**		**41.667**
N of Obs	13		13
Network Centralization (Outdegree)		**33.333%**	
Network Centralization (Indegree)		24.306%	
Average Degree		**2.308**	

Note. Elaboration with UCINET based on MGC (2018).

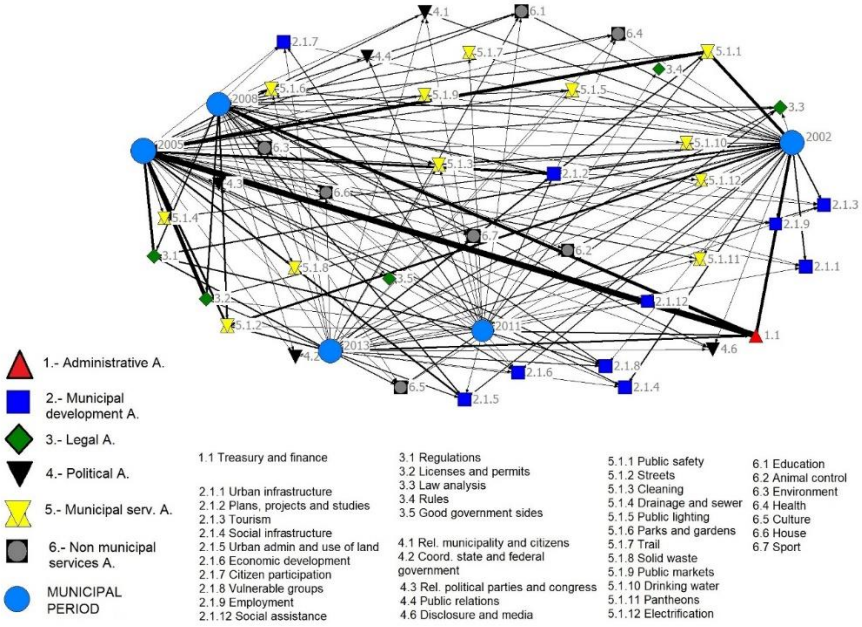
The graph representing the degree centrality of the agendas and periods [Fig. 4], indicates that the most important link is the 'Municipal Services Agenda'. This category represents a significant co-occurrence in terms of mention in public hearings. Another graph represents the centrality of the subcategories and periods [Fig.5], indicating as the most promoted the subcategory 'Treasury and Finance'. In both graphs, there is a thickness link in the 2002-2005 and 2005-2008 periods where there was more incidence in public hearings, which means that they are the periods when more public actions were debated.

Figure 4. Network graph related to degree centrality of the agendas and periods



Note. Elaboration with NETDRAW based on MGC (2018).

Figure 5. Network graph related to degree centrality of subcategories and periods



Note. Elaboration with NETDRAW based on MGC (2018).

The relationship between the periods and SDGs' - The network has 19 nodes, with 51 links (Table 8). There is a density of 5.749(57.49%), and an average degree of 103.474. This indicates that the connections are distributed between the SDGs' since we have 57.49% (density) of possible links. It also tells us that the SDGs' have 103.474 (average degree) average links.

'2005-2008 Municipal Period' has the most critical value for the out-degree index (Table 9), and the SDG 11 has the main in-degree index, which means that those are the most frequently approached. In total, network centralization for outdegree is 13.742% and for indegree 12.927% and the variance is 19.010 for outdegree and 14.528 for indegree, which indicates that they are close to the average. We also obtain the average degree, which indicates that all nodes (network size=19 nodes) have 103.474 links.

Table 9. The relationship between the periods and SDGs'

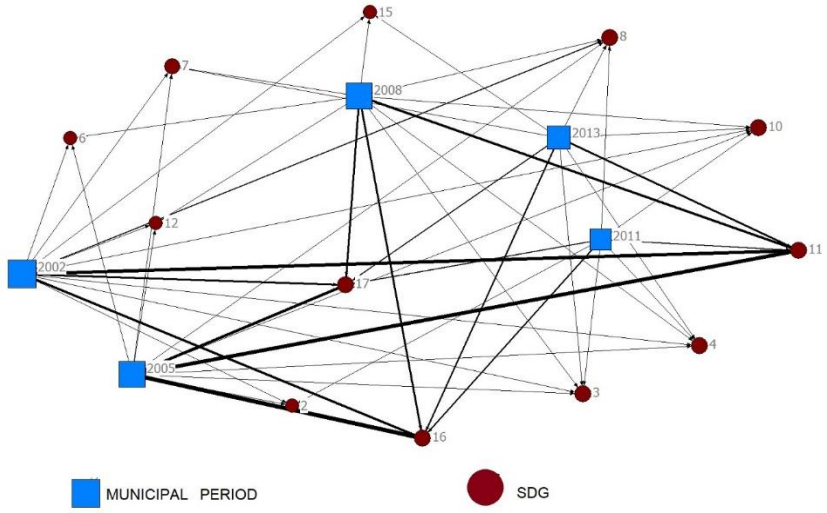
ID	OutDeg		Indeg
2005	15.3		
2002	11.089		
2008	7.496		
2013	5.754		
2011	3.704		
SDG 11			14.528
SDG 16			13.051
SDG 17			9.083
SDG 8			1.830
SDG 4			1.014
SDG 10			0.882
SDG 7			0.772
SDG 6			0.750
SDG 3			0.463
SDG 2			0.397
SDG 12			0.331
SDG 15			0.243
DESCRIPTIVE STATISTICS			
	OutDeg		**Indeg**
Mean	2.281		2.281
Std Dev	4.360		4.424
Sum	43.342		43.342
Variance	19.010		19.573
Minimum	0		0
Maximum	15.3		14.528
N of Obs	19		19
Network Centralization (Outdegree)		13.742%	
Network Centralization (Indegree)		12.927%	
Average Degree		103.474	

Note. Elaboration with UCINET based on MGC (2018).

The final graph represents the degree centrality of the periods and SDGs' [Fig. 6], where the most influential node corresponds to the 'Municipal period 2005-2008' [output degree]. The most important link is the SDG 11 related to 'Sustainable Cities and Communities' [input degree];

belonging to a relevant agenda, this SDG represents the main co-occurrence in terms of mention in public hearings.

Figure 6 - Network graph related to degree centrality of the periods and SDGs'



Note. Elaboration with NETDRAW based on MGC (2018).

The relationship between the SDGs' with sectors - The most promoted SDG is the 11, which specify 'Sustainable Cities and Communities', with 33.52%, which corresponds to 659 public actions. Secondly is the SDG 16, which indicates 'Peace, Justice and Solid Institutions' with a 30.11%; thirdly, the SDG 17 that manifests 'Revitalize the Global Partnership for Sustainable Development'; and in fourth place the SDG 8 that stipulate 'Decent Work and Economic Growth' [Table 10]. The targets specified for SDG 11 are: access for all people to housing, essential services, safe and affordable transportation systems, increase inclusive urbanization, participatory planning and management, protection of cultural and natural heritage, reduction of economic losses caused by natural disasters, reduction of environmental impact [putting attention to air quality and waste management], universal access to green areas and safe public spaces, positive links in urban areas, inclusive cities, resilience, and sustainable buildings. Therefore, this objective is directly related to the Municipal Development Agenda, in terms of infrastructure and urban development, as well as the municipal services agenda, which is responsible for providing essential services to the entire population and the non-municipal services agenda, in terms of environment and culture. For this reason, the SDG 11 is the most

approached topic, since what drives the municipality to sustainable practices are projects, studies and construction of urban and social infrastructure.

The SDG 16, is related to reduced corruption, social justice, and violence reduction. For this reason, it is related to the subcategory of Public Security, for which the topics covered in the minutes place particular emphasis on service from the same to the local and tourist community. The SDG 17 indicates 'Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development'", for this the collegiate body addresses issues related to the management of resources and policies with the state and federal government. The SDG 8 refers to the subcategories of 'Tourism, Economic Development and Employment' because its goals specify raising economic productivity to create jobs and promote the growth of small and medium-sized enterprises [SMEs].

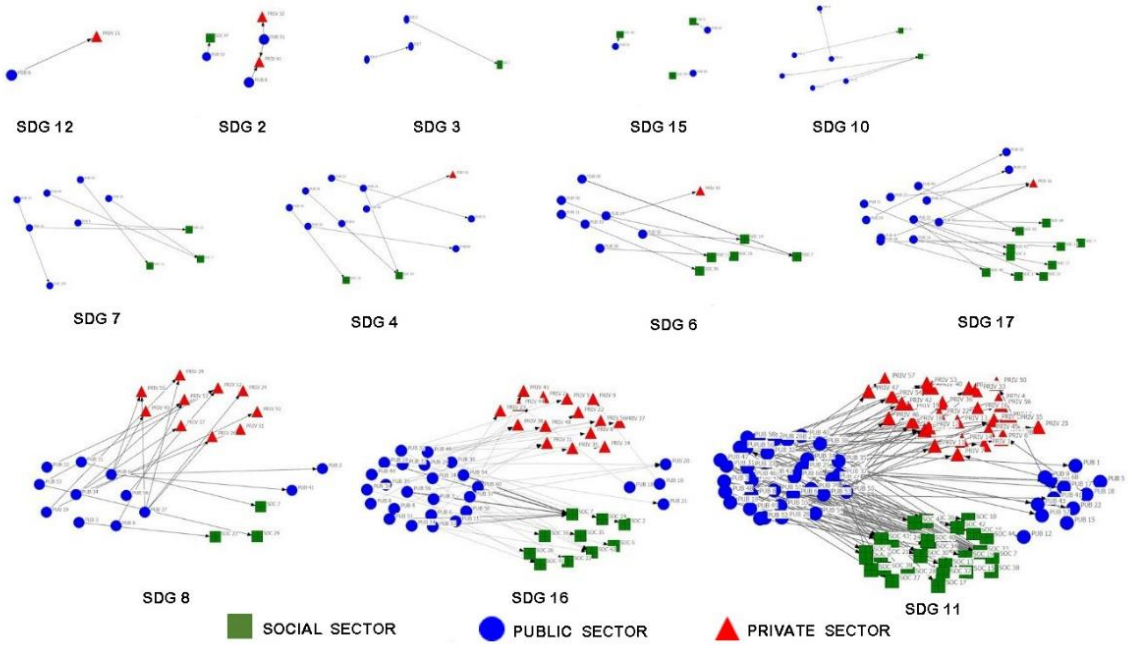
Table 10. Relationship of SDGs' with percent of actions

SDG	Co-occurrences	Percent
11 "Sustainable cities and communities"	659	33.52%
16 "Peace, justice and strong institutions"	592	30.11%
17 "Partnerships for the goals"	412	20.96%
8 "Decent work and economic growth"	83	4.22%
10 "Reduced equalities"	46	2.34%
7 "Affordable and clean energy"	40	2.03%
4 "Quality education"	35	1.78%
2 "Zero hunger"	34	1.73%
6 "Clean water and sanitation"	21	1.07%
12 "Responsible consumption and production"	18	0.92%
3 "Good health and well-being"	15	0.76%
15 "Life on land"	11	0.56%

Note. Elaboration based on MGC, 2018.

This final graph indicates the relationships between sectors and SDG promoted (Figure 7). The SDG 11, 16, and 8 were promoted the most by the private sector and public sector, mostly because they are related to economic development. The social sector promotes SDG 11, 16, and 17 the most. It is essential to mention that the social and private sectors are a source of information.

Figure 7. Relationship of SDGs' with sectors



Note. Elaboration with NETDRAW based on MGC (2018).

DISCUSSION

The findings suggest that according to how the state directs public actions, sustainability is used for promoting tourism and the needs of citizens are put in second place. This could be related to the inequality in the representation of the private and social sectors. Deliberative participation requires representing all interested parties in public hearings. The meetings promote democracy, giving rise to the empowerment of citizens and political information and power in the formation of social capital in favor of sustainability.

The importance of analyzing the influence of the SDGs' in the decision-making of the public agenda helped to reveal the unbalance in the pillars of sustainability in public actions, based on the transnational precepts that promote SDGs', which in turn is governed through social justice in local management, to promote a culture of participation. The main economic activity in Cozumel is tourism, so this field is more promoted and thus the SDG 11 is more relevant. This is why it is relevant to emphasize that, to achieve sustainability of the tourist destination, a greater capacity for organization, preparation, and analysis of the issues to be addressed is needed in a democratic environment based on consensus, where everyone has an equal opportunity to intervene.

From the social media approach, it was possible to visualize the degrees of importance of the public actions on the public agenda, emphasizing their interaction with the SDGs'. Specifically, it is a tool that allows the identification of structures in particular cases, where the themes that influence decision-making are revealed. the links to others to promote or hinder the implementation of the SDGs'. Finally, this approach could promote future research in which public actions could be studied at the local level, highlighting the need to further address the goals established by the SDGs' for their correct fulfillment.

FINAL CONSIDERATIONS

This study allows us to have a general visualization about the text analysis of public actions, encompassing the SGD's most promoted. Centrality measures were used to highlight the most important nodes in the network maps, highlighting the sectors that have had the greatest impact on local management. Deliberative participation requires representing all interested parties in public hearings; in this analysis, the bias could be underrepresented voices in meetings. It is intended to carry out an in-depth study with the actors and pronounce their interests concerning Sustainable Development Goals in the tourist destination, emphasizing the inclusion of the actors as a stepping stone to achieving in search of the practice of participatory governance. This research aims to be the basis for the identification of an adequate decision-making model at the local level, where the incidence of the sectors promotes sustainable development, based on the benefit of the local population.

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