INTERDEPENDENCE BETWEEN THE TOURIST REGIONS OF SERGIPE, BRAZIL

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INTRODUCTION

- Recent years have begun to show a scenario of world recovery in tourist activity, which had been severely affected by the COVID-19 pandemic.

- In 2019, tourism accounted for 10.3% of the world's GDP.

  – In 2021 and 2022, however, this share dropped to 6.1% and 7.6%, respectively, which is still below the pre-pandemic levels.

  – Brazil, an important tourist destination in South America, was also severely impacted by the pandemic. Ribeiro et al. (2021) estimated a 31% drop in the GDP of Brazilian tourist activities in 2020.

INTRODUCTION

- Tourism is an important development alternative for poorer countries or regions.

- In Brazil, tourism has already been used explicitly as a regional development policy.

  - PRODETUR Nacional; PRODETUR NE I and II.

  - Tourism reduces regional inequalities in the country.

INTRODUCTION

- The scarcity of resources in poorer states, often located in peripheral regions, contributes to the fact that tourism policy is not a priority in state public management, as is the case of Sergipe, located in the Brazilian Northeast.

  – Although the state has tourism potential in several segments (sun and beach, adventure, and historical-cultural), they are not fully exploited.

- Constructing tools that can aid tourism planning is fundamental for tourism development.

  – This paper aims to build an inter-regional input-output (IO) system for Sergipe's tourist regions and identify the contribution of Tourism Characteristic Activities (TCAs) to the state economy.

  – TCAs brings together tourism-related sectors, such as transportation, accommodation and food services, travel agencies and entertainment and leisure services.
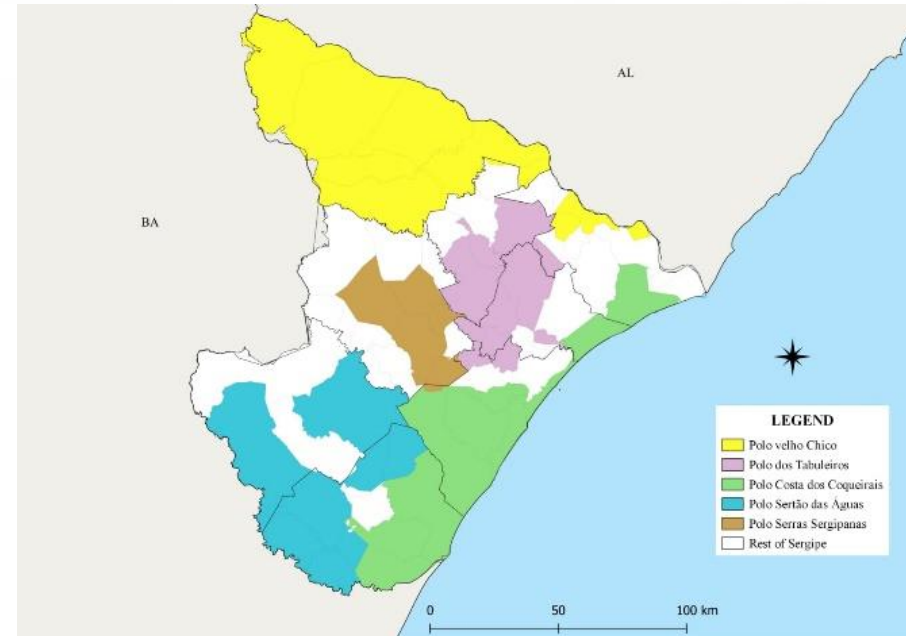
INTRODUCTION

- This paper offers an unprecedented database for Brazil and Sergipe by sectorally and regionally disaggregating tourist activities.

- The method for estimating tourism can be replicated in countries and regions without a Tourism Satellite Account, such as Brazil.

- The disaggregation of the TCAs avoids overestimating the effects of tourism on the state economy.

TOURIST REGIONS OF SERGIPE

The state is subdivided into five distinct region:

- This document guides the preparation and implementation of public policies by the Ministry of Tourism.

- In Brazil 2021, 338 tourist regions were defined, of which five belong to the state of Sergipe.

- Only some municipalities are part of a tourist region since they must meet criteria jointly established by state agencies and the Ministry of Tourism.

- Municipalities are categorized (A, B, C, D, or E) due to the performance of their tourism economy, with A being the best classification and E being the worst.
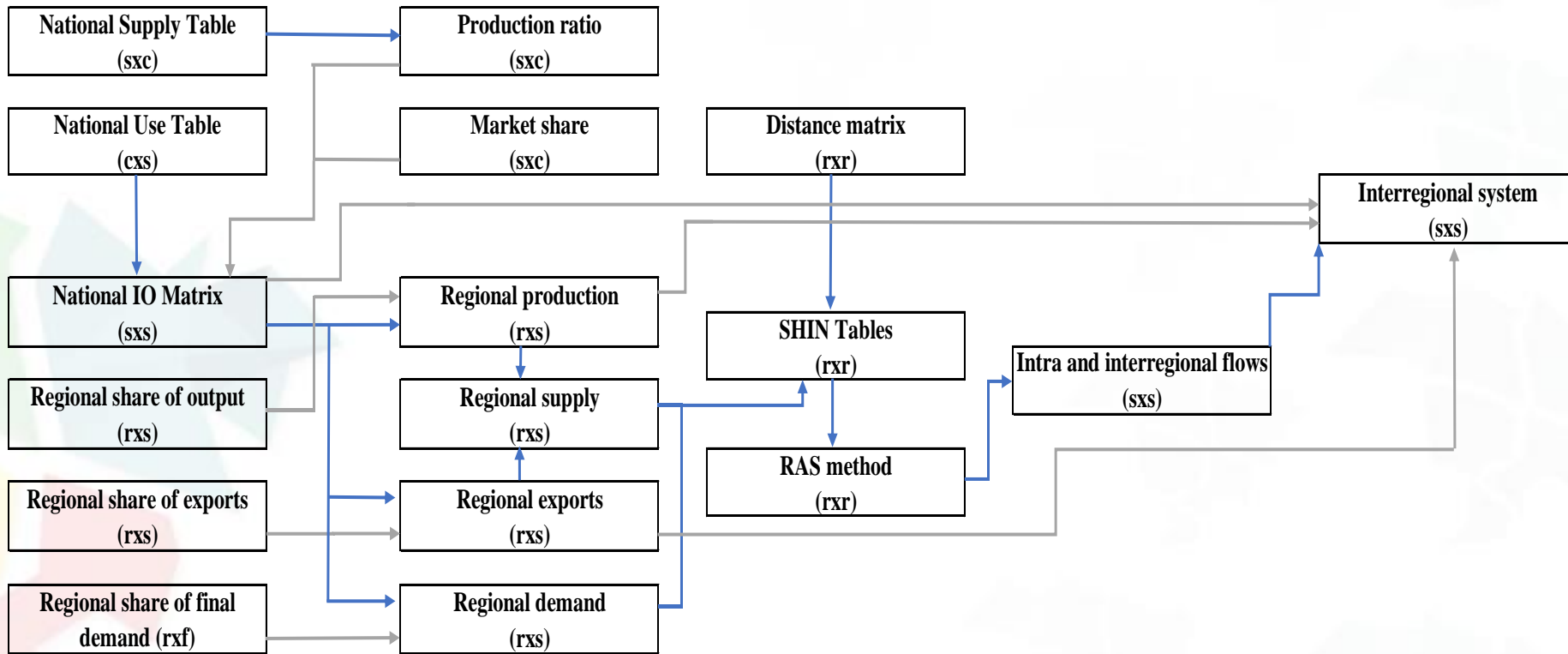

LEGEND
Polo velho Chico
Polo dos Tabuleiros
Polo Costa dos Coqueirais
Polo Sertão das Águas
Polo Serras Sergipanas
Rest of Sergipe

TOURIST REGIONS OF SERGIPE

Polo Costa dos Coqueirais (10)	ID
Aracaju	A
Barra dos Coqueiros	C
Estância	C
Indiaroba	E
Itaporanga d'Ajuda	D
Nossa Senhora do Socorro	C
Pacatuba	D
Pirambu	D
Santa Luzia do Itanhy	E
São Cristóvão	D

Polo dos Tabuleiros (11)	
Aquidabã	D
Capela	D
Carmópolis	D
Cumbe	E
Divina Pastora	E
Maruim	E
Muribeca	E
Nossa Senhora das Dores	D
Riachuelo	E
Santa Rosa de Lima	E
Siriri	D

Polo Serras Sergipanas (5)	
Areia Branca	E
Frei Paulo	D
Itabaiana	C
Moita Bonita	E
Ribeirópolis	E

Polo Sertão das Águas (8)	ID
Boquim	D
Cristinápolis	D
Itabaianinha	D
Lagarto	C
Salgado	D
Tobias Barreto	C
Tomar do Geru	D
Umbaúba	D

Polo Velho Chico (11)	
Canindé de São Francisco	D
Cedro de São João	D
Gararu	D
Monte Alegre de Sergipe	D
Nossa Senhora da Glória	D
Nossa Senhora de Lourdes	D
Poço Redondo	D
Porto da Folha	D
Propriá	C
Santana do São Francisco	E
Telha	D

Tourist regions	Population (%)	GDP (%)	per capita GDP (R$)
Polo Costa dos Coqueirais	48.9	54.9	21,995
Polo dos Tabuleiros	6.8	5.2	15,000
Polos Serras Sergipanas	6.9	6.6	18,654
Polo Sertão das Águas	13.1	8.6	12,908
Polo Velho Chico	9.1	12.5	26,750
Rest of Sergipe	15.2	12.2	15,755

INTER-REGIONAL INPUT-OUTPUT SYSTEM FOR TOURIST REGIONS

- The construction of the interregional system used the Interregional Input-Output Adjustment System – IIOAS method, widely employed in the international literature for several countries worldwide.

- The IIOAS method is recommended in contexts where statistical information is limited.

  - Nonetheless, the method demonstrates adherence, consistency, and robust results.

  - In the absence of an official IO matrix for the state of Sergipe, we use the latest official Brazilian IO matrix for the base year 2015, which comprises 67 sectors (or industries) and 127 commodities to generate an interregional system that includes the Sergipe's tourist regions.

Steps of the IIOAS method

s, c, r, and f mean sectors, commodities, regions, and final demand components.

DATABASE

- We obtained information on sectoral production from different municipal data sources.

  - Municipal Agricultural Production Survey, 2015

  - Municipal Livestock Survey, 2015

  - Plant Extraction Production Survey, 2015

  - Annual Employment Information Report, 2015

  - Census, 2010

DATABASE

- According to IBGE, tourism comprises the following activities:

  i) restaurants and accommodation services;

  ii) passenger transportation;

  iii) travel agencies and tour operators; and

  iv) recreational and entertainment services.

- Matching this information with the IO matrix, we identify six TCAs: S34 - Land transportation; S35 - Water transportation; S36 - Air transportation; S38 - Accommodation; S39 - Food services; S57 - Artistic, creative, and entertainment activities; and S50 - Other administrative and support services.

  - The last activity includes Travel Agencies

DATABASE

- However, given the absence of a Tourism Satellite Account in Brazil and Sergipe, using these sectors directly without any statistical treatment would overestimate the weight of tourism activities in the economy.

- Thus, it is necessary to disaggregate these sectors.

- For the state of Sergipe, the Institute of Applied Economic Research provided monthly sectoral weights for 2015.

DATABASE

TCAs	Sergipe	Brazil
Food services	0.22	0.27
Water transportation	0.00	0.10
Air transportation	0.95	0.83
Travel agencies	0.83	0.78
Culture and leisure	0.15	0.04
Accommodation	0.86	0.78
Non-metropolitan land transportation	0.21	0.26

- Due to minor weight variations throughout 2015, we consider the weight for December.

- Based on these weights, the trade flows of the corresponding sectors in the IO matrix were disaggregated.

IO INDICATORS

- To structurally evaluate the TCAs in the tourist regions of Sergipe, we calculate the simple production and employment multipliers and the HR indexes.

- As these indicators are well known, I chose not to present them formally.

RESULTS

- We estimated that tourist activities accounted for only 1.53% of the state GDP in 2015.

  - IPEA estimated the weight of tourism in the Northeast region and Brazil at 2.1% and 2.2%, respectively, considering occupation data in December 2014.

  - When considering wages in the formal labor market, Gonçalves et al. (2020) estimated at 3.02% the weight of TCAs in the total GVA of Sergipe in 2015.

  - Without the disaggregation of TCAs from the coefficients, the weight of the "tourism sector" in the Sergipe's GDP would be overestimated by 3.7 times, i.e., 5.6%.

GDP regional distribution of TCAs in Sergipe, 2015

Tourist activities	Polo Costa dos Coqueirais	Polo dos Tabuleiros	Polo Serras Sergipanas	Polo Sertão das Águas	Polo Velho Chico	Resto de Sergipe
Tourist land transportation	69.1%	6.5%	7.1%	6.7%	4.6%	6%
Tourist air transportation	100%	0%	0%	0%	0%	0%
Tourist accommodation	83.6%	1.1%	0.9%	2.8%	7.9%	3.7%
Tourist food services	76.9%	1.7%	6.4%	6.9%	3.3%	4.7%
Professional tourist services	91.3%	0.2%	4.2%	0.9%	2.7%	0.7%
Artistic, creative, and tourist entertainment activities	78.1%	0.8%	4.6%	7.5%	2.7%	6.3%

- We can see an intense concentration in the Polo Costa dos Coqueirais, which accounts, on average, for 83.2% of the value-added generation of TCAs within the state of Sergipe.

- Except for the Polo Costa dos Coqueirais, the GVA for Tourist land transportation has a more homogeneous distribution among the other tourist regions.

- The only airport in Sergipe is in the capital, Aracaju, which explains the generation of 100% of GVA for Tourist air transportation in the Polo Costa dos Coqueirais.

Production multiplier by tourist activity and tourist region of Sergipe, 2015

Tourism Activities	Polo Costa dos Coqueirais			Polo dos Tabuleiros			Polo Serras Sergipanas			Polo Sertão das Águas			Polo Velho Chico			Rest of Sergipe		
	Intra	Inter	Total	Intra	Inter	Total	Intra	Inter	Total	Intra	Inter	Total	Intra	Inter	Total	Intra	Inter	Total
Tourist land transport	1.07	0.88	1.95	1.09	0.90	1.98	1.08	0.91	1.99	1.04	0.94	1.99	1.02	0.97	1.99	1.04	0.91	1.94
Tourist air transport	1.03	1.06	2.09	1.03	1.09	2.12	1.02	1.12	2.13	1.01	1.12	2.14	1.01	1.14	2.15	1.02	1.05	2.07
Tourist accommodation	1.06	0.64	1.70	1.05	0.66	1.71	1.04	0.67	1.70	1.02	0.68	1.70	1.04	0.67	1.70	1.03	0.67	1.70
Tourist food	1.03	0.83	1.85	1.03	0.83	1.87	1.03	0.83	1.86	1.02	0.84	1.86	1.01	0.86	1.87	1.02	0.84	1.86
Professional tourist services	1.02	0.96	1.98	1.03	0.93	1.96	1.02	0.96	1.98	1.01	0.94	1.95	1.01	0.99	2.00	1.03	0.95	1.97
Artistic, creative activities and tourist shows	1.04	0.55	1.60	1.02	0.58	1.60	1.02	0.58	1.60	1.01	0.59	1.60	1.02	0.58	1.60	1.01	0.58	1.60
Economy average	**1.05**	**0.79**	**1.83**	**1.05**	**0.80**	**1.85**	**1.04**	**0.81**	**1.84**	**1.02**	**0.82**	**1.84**	**1.02**	**0.83**	**1.85**	**1.03**	**0.81**	**1.83**

- The simple production multiplier of Tourist land transportation varies between 1.94 and 1.99 between tourist regions.
- However, the spillover effect (inter multiplier) varies between 0.88 and 0.97.
- For each variation of $ 1 in the final demand of Tourist land transportation in Polo dos Tabuleiros, for instance, the entire economy would have to produce $ 1.98 to meet this variation, with $ 1.09 being produced in the region itself and $ 0.90 would be leaked to other regions.

Employment multiplier by tourist activity and tourist region of Sergipe, 2015

Tourism Activities	Polo Costa dos Coqueirais			Polo dos Tabuleiros			Polo Serras Sergipanas			Polo Sertão das Águas			Polo Velho Chico			Rest of Sergipe		
	Intra	Inter	Total	Intra	Inter	Total	Intra	Inter	Total	Intra	Inter	Total	Intra	Inter	Total	Intra	Inter	Total
Tourist land transport	16	5	21	16	5	21	22	5	27	27	5	32	26	5	31	26	5	31
Tourist air transport	3	6	9	0	6	6	0	6	6	0	6	6	0	7	7	0	6	6
Tourist accommodation	17	6	23	22	6	28	40	6	46	32	6	38	22	6	28	28	6	34
Tourist food	24	7	31	45	7	52	28	7	35	38	7	45	50	8	58	54	7	61
Professional tourist services	7	7	14	11	7	18	9	7	16	24	7	31	8	7	15	29	7	36
Artistic, creative activities and tourist shows	36	4	40	64	4	68	60	4	64	80	4	84	84	4	88	87	4	91
Economy average	**14**	**6**	**20**	**19**	**6**	**25**	**19**	**6**	**25**	**22**	**7**	**29**	**20**	**7**	**27**	**23**	**7**	**30**

- Generally, there is greater regional variability in the total multiplier and a smaller one in the inter-regional employment multiplier.
- The spillover effect (inter) is low in all ACTs in all tourist regions since the activity is developed locally.
- The highest employment multiplier among the TCAs is that of Artistic, creative, and touristic entertainment activities, varying between 40 and 89 among the tourist regions, even well above the regional multipliers.

HR indexes of tourist activity by tourist region of Sergipe, 2015

Tourism Activities	Polo Costa dos Coqueirais		Polo dos Tabuleiros		Polo Serras Sergipanas		Polo Sertão das Águas		Polo Velho Chico		Rest of Sergipe	
	BL	FL	BL	FL	BL	FL	BL	FL	BL	FL	BL	FL
Tourist land transport	**1.023**	1.136	**1.035**	1.209	**1.040**	1.202	**1.022**	1.116	**1.003**	1.044	**1.010**	1.044
Tourist air transport	0.982	0.956	0.978	0.951	0.981	0.965	0.990	0.978	0.986	0.980	0.993	0.972
Tourist accommodation	**1.012**	0.958	0.995	0.953	**1.000**	0.966	**1.003**	0.980	**1.016**	0.982	0.997	0.975
Tourist food	0.983	0.957	0.982	0.952	0.989	0.968	0.996	0.980	0.992	0.981	0.989	0.973
Professional tourist services	0.975	0.958	0.978	0.951	0.988	0.966	0.991	0.978	0.987	0.981	0.999	0.972
Artistic, creative activities and tourist shows	0.997	0.956	0.974	0.951	0.983	0.965	0.992	0.979	**1.000**	0.980	0.985	0.972

- Tourist land transportation is the only TCA ranked as a key sector across all tourist regions, i.e., both indices above one.

- Backward linkages are greater than forward linkages, which means that tourism activities buy more inputs from other sectors than they sell. This result is expected and consistent with previous studies.

CONLUSIONS

- This research advances the estimation of an inter-regional IO system specified for tourist regions in Sergipe and disaggregates the tourism activities

  - The ideal scenario is the Brazilian statistical officers' availability of the Tourism Satellite Accounts

  - Thus, the impacts of these activities can be estimated more precisely

- We used an unprecedented method that disaggregates tourist activities by sector and region

  - In addition, with the identification of TCAs in Sergipe, it was possible to measure the spillover effect to other regions explicitly

  - It can be useful for elaborating and implementing tourism policies focused on regional production chains

- The main limitation of the research, however, is that the technical coefficients of disaggregated tourist activities, for example, tourist accommodation and non-tourist Accommodation, are the same

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