

Analysis of the Role of the Tourism Sector in the Economy of Bali Province (Input-Output Table)

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ABSTRACT: This research aims to investigate the role of the tourism sector in the economy of Bali Province. In detail, this study examines: 1) the role of the tourism sector in the economy seen from the final demand and gross value added side, 2) how big the multiplier of the tourism sector is on output, income and employment, 3) how the forward and backward linkages of the tourism sector to other economic sectors. The approach used is the Tourism-Led Growth (TLG) hypothesis, the institutional economic approach, and input-output (I-O) analysis. Data collected through BPS data is the Input-Output Table of Bali Province in 2016. Data analysis uses 3 techniques, namely: 1) Descriptive Analysis, 2) Linkage Analysis, and 3) Multiplier Analysis. The outcomes of the research indicate that the role of the tourism sector is not yet included in the category of key sectors in the economy. However, this sector makes a significant contribution to regional output and gross value added, as well as being a trigger for the growth of supporting sectors in Bali Province.

KEYWORDS: Tourism sector, input-output analysis, Gross value added (GVA), Bali Province

I. INTRODUCTION

Bali is widely known as a prime tourist destination for both domestic and international tourists. The Balinese people rely heavily on the tourism sector due to the numerous job opportunities and economic activity associated with it. According to the Bali Province Regional Fiscal Study report published by the Ministry of Finance, the tourism sector contributed approximately 54 percent to Bali's Gross Regional Domestic Product (GRDP) in 2019. However, the global COVID-19 pandemic has had a significant impact on Bali's economy. Throughout 2020, the province's economic growth contracted by minus 9.3 percent, the deepest decline compared to other provinces in Indonesia. Prior to the pandemic, Bali's economic growth had consistently been above the national average. But, the COVID-19 pandemic, which began spreading in late 2019, has significantly impacted Bali's tourism sector. The fear of infection and imposed travel restrictions have led to a dramatic fall in the volume of tourists, domestically and internationally. This has directly impacted the income of local communities who depend on this sector for their livelihood, with revenues dropping by as much as 45 percent. Furthermore, the pandemic has impacted various other aspects of the tourism industry, including hotel occupancy rates and average length of stay. A study at The Samaya Ubud Bali showed a significant decline in both indicators during the pandemic.

In an effort to revive the tourism sector, the government and industry players in Bali have implemented various strategies, such as the Cleanliness, Health, and Safety (CHS) program and the digitalization of services to minimize physical contact. Furthermore, the hosting of international events such as the G20 in Bali in 2022 also had a positive impact on the regional economy, with a Gross Regional Domestic Product (GRDP) increase of IDR 25 trillion compared to the previous year. However, the COVID-19 pandemic that hit in 2020 had a significant impact on this sector. The contribution of the accommodation and food and beverage sector to Bali's GRDP dropped sharply to 18.33 percent in 2020 and again to 16.6 percent in 2021. This decline was the worst in the past decade, reflecting the drastic decline in tourist numbers due to national and international mobility restrictions.

Over time, this sector has begun to recover. In 2022, it recorded a contribution of 17.98 percent, rising to 19.93 percent in 2023, and significantly increasing to 21.42 percent in 2024. This increase was driven by the reopening of tourist access, increased economic activity, and extensive promotion of the tourism sector by both the regional and central governments. This sector in Bali contributes significantly in terms of employment. This sector is one of the main employment opportunities for Balinese residents, especially given the region's heavily tourism-dependent economic structure.

Entering 2023, Bali's tourism sector is showing a significant recovery trend. Data from the Bali Province Central Statistics Agency

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(BPS) recorded that in December 2023, number of foreign tourists visiting Bali reached 551,100 visits, a 16.54 percent increase compared to the previous month. Australian tourists dominated with a 25.70% share (BPS Bali, 2024). The Room Occupancy Rate (TPK) of star-rated hotels also increased, reaching 62.19% in December 2023, up 7.30 points from the previous month and 8.44 points compared to December 2022. Hotels recorded an average stay of 2.49 days for domestic and international guests, marking a modest rise compared to the prior month (BPS Bali, 2024).

The increased contribution of this sector reflects the ongoing full recovery of Bali's tourism sector after the COVID-19 pandemic. Both domestic and international tourist activity has surged, supported by the reopening of international flights, relaxation of entry policies, and the local government's intensive promotion of sustainable tourism. This has directly impacted demand for hotels, restaurants, and other culinary services. Furthermore, international and national events held in Bali throughout 2024 will also be a major catalyst for growth in the accommodation and food and beverage sectors. MICE (Meetings, Incentives, Conventions, and Exhibitions) activities will also significantly boost hotel occupancy and the growth of the local culinary industry. Research by the UNWTO (2021) and Ritchie et al. (2020) confirms that the tourism sector has a strong multiplier effect on employment, particularly in tourism-dependent regions like Bali. Ritchie et al. state that tourism is a key catalyst for economic inclusion and unemployment reduction in developing regions that rely on services and hospitality. Invalid source specified. Research by Sari and Putri (2022) using 2016 Input-Output Table data shows that the tourism sub-sector has a significant impact on the Balinese economy, although it is still relatively small compared to other sectors. Invalid source specified.

This study presents novelty in its approach by employing the Input-Output Table to comprehensively analyze the role of the tourism sector in the economy of Bali Province. Unlike previous studies that primarily focused on general macroeconomic indicators or the contribution of tourism to GDP alone, this research explores the intersectoral linkages between tourism and other economic sectors, including its direct, indirect, and multiplier effects. Through this method, the study offers a more accurate mapping of tourism's actual contribution to the structure and dynamics of Bali's economy, paving the way for more evidence-based and targeted policy formulation to support sustainable tourism-driven regional development.

II. RESEARCH METHOD

This study examines the role of the tourism sector in the economy of Bali Province using the Input-Output (I-O) Table approach. The scope of the analysis covers 9 regencies/cities in Bali Province with a focus on the variables of Output, Final Demand, and Gross Value Added (GVA). The data used are sourced from the Input-Output Table of Bali Province in 2016, which was compiled through collaboration between the Central Statistics Agency (BPS) and the Regional Development Planning Agency (BAPPEDA) of this Province. The analytical methods used include descriptive analysis, backward and forward linkage analysis, and multiplier analysis.

The type of data used in this study is descriptive quantitative data research. The data sources collected in this study consist of secondary data. The data collection method used is from the Input-Output Table. The data analysis techniques used are Descriptive Analysis and Quantitative Analysis, namely: 1) backward and forward linkage analysis, and 2) multiplier analysis.

III. RESULTS AND DISCUSSION

The 2024 Input-Output (IO) table for Bali Province used in this study is an estimate obtained through an adjustment process from the previous year's IO table using the RAS method with the aid of Microsoft Excel software. In general, an Input-Output Presented in the form of a matrix, a table statistically represents the flow of goods and services transactions between sectors in a regional economy during a given time frame. The 2024 Bali Province Input-Output Table classifies 17 economic sectors, with the RAS method applied in its compilation.

Table 1 Classification of 17 Economic Sectors in the Input-Output Table

Description	Code
Agriculture, Forestry, and Fisheries	A
Mining and Quarrying	B
Processing Industry	C
Electricity and Gas Procurement	D
Water Supply, Waste Management, and Recycling	E
Construction	F
Wholesale and Retail Trade; Automobile and Motorcycle Repair	G
Transportation and Warehousing	H

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Provision of Accommodation and Food and Beverages	I
Information and Communication	J
Financial Services and Insurance	K
Real Estate	L
Company Services	MN
Government Administration, Defense, and Mandatory Social Security	O
Education Services	P
Health Services and Social Activities	Q
Other Services	RSTU

Source: BPS Bali Province, 2025

Based on the processing results, the framework of the static and open Input-Output model, the compilation of transaction data in this table is based on three main assumptions: 1) Homogeneity (uniformity of commodity types within each sector), 2) Proportionality (a constant input-output relationship between sectors), and 3) Additivity (output total is the sum of inter-sectoral use and final consumption). Considering the importance of using the latest data in economic analysis, an update process was carried out on the table using the RAS method, resulting in the estimated IO Table for 2024. This update process was carried out through 50 iterations to ensure that the estimated results are in line with the structure and conditions of the Balinese economy in the reference year in question.

For analyses requiring annual data, non-survey approaches are often used, allowing for estimation of the input-output structure without conducting a full new survey. One of the most commonly used methods is the RAS method, an estimation technique for updating the technology coefficient matrix based on a base year's IO table. The RAS method is used to estimate the technology coefficient matrix $A(t)$ at a period t , using the matrix from the previous year $A(0)$, and adjusting it to reflect the latest total input and output information.

Based on the updated data from the Bali Province Input-Output Table to 2024, the Gross Value Added (GVA) was obtained from 17 key economic sectors. The Accommodation and Food and Beverage Provision (code I) sector recorded the highest GVA, at IDR 63.91 trillion. This achievement confirms that this sector is the main driver of Bali's economy, directly linked to tourism activities. GVA reflects the contribution of a sector to the gross regional domestic product (GRDP) directly.

Table 2 Gross Value Added of 17 Sectors in Bali Province's Input-Output Table Year

Description	Code	GVA	Percent (%)
Agriculture, Forestry, and Fisheries	A	40 059 243	13,4
Mining and Quarrying	B	2 549 774	0,9
Processing Industry	C	18 637 069	6,2
Electricity and Gas Procurement	D	717 468	0,2
Water Supply, Waste Management, and Recycling	E	458 996	0,2
Construction	F	27 567 305	9,2
Wholesale and Retail Trade; Automobile and Motorcycle Repair	G	25 933 890	8,7
Transportation and Warehousing	H	30 615 664	10,3
Provision of Accommodation and Food and Beverages	I	63 912 735	21,4
Information and Communication	J	16 101 487	5,4
Financial Services and Insurance	K	15 457 623	5,2
Real Estate	L	11 449 018	3,8
Company Services	MN	3 455 353	1,2
Government Administration, Defense, and Mandatory Social Security	O	14 933 541	5,0
Education Services	P	14 228 759	4,8
Health Services and Social Activities	Q	7 066 962	2,4
Other Services	RSTU	5 296 624	1,8

Source: Data processing result, 2025

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Research results suggest that the tourism sector is not only the largest contributor to output but also capable of creating significant added value. This demonstrates that tourist spending extends beyond accommodation to other sectors through backward linkages, such as agriculture, trade, and transportation. In addition to the accommodation sector, Transportation and Warehousing (H) and Trade (G) also recorded high GVA, strengthening evidence that tourism-supporting sectors also benefit directly from the economy. Conversely, sectors such as Water Supply (E) and Electricity (D) have relatively low GVA, reflecting their characteristics as capital-intensive supporting sectors that are not dominant in the local value chain.

Final consumption in the context of the Input-Output Table refers to the use of goods and services by final consumers, which includes household consumption, government consumption, gross fixed capital formation (investment), changes in inventories, and exports. Unlike intermediate inputs, final consumption is not reused in the production process, thus reflecting the real demand for final goods and services. An increase in final consumption will directly encourage production, added value, and job creation through a chain effect (multiplier effect).

Table 3 Final Consumption of 17 Sectors Input-Output Table of Bali Province in 2024

Description	Code	Final Consumption
Agriculture, Forestry, and Fisheries	A	24308854
Mining and Quarrying	B	662085,7
Processing Industry	C	20355180
Electricity and Gas Procurement	D	299946,3
Water Supply, Waste Management, and Recycling	E	425077,3
Construction	F	37439066
Wholesale and Retail Trade; Automobile and Motorcycle Repair	G	21465668
Transportation and Warehousing	H	34895282
Provision of Accommodation and Food and Beverages	I	74782597
Information and Communication	J	11698317
Financial Services and Insurance	K	8017879
Real Estate	L	9956999
Company Services	MN	1384909
Government Administration, Defense, and Mandatory Social Security	O	21162462
Education Services	P	16933046
Health Services and Social Activities	Q	8680698
Other Services	RSTU	5973444

Source: Data processing result, 2025

Based on final consumption data, the Accommodation and Food and Beverage sector recorded the highest value of IDR 74.78 trillion, confirming its key role as a driver of the Balinese economy through the tourism sector. This directly correlates with the sector's dominance as a primary draw for both domestic and international tourists, which directly increases their consumption spending in this sector. In addition to the main tourism sector, the Construction (F) and Transportation and Warehousing (H) sectors also showed high final consumption values, amounting to IDR 37.43 trillion and IDR 34.90 trillion, respectively. This reflects the important role of infrastructure development and logistics systems in supporting general economic activities, including tourism. The Agriculture, Forestry, and Fisheries (A) sector also had a large final consumption (IDR 24.31 trillion), demonstrating its relevance as a supplier of raw materials for food and local commodities that support the tourism value chain, especially in the local culinary sector.

Furthermore, the Wholesale and Retail Trade (G) and Manufacturing (C) sectors also occupy significant roles in final consumption, with values of IDR 21.47 trillion and IDR 20.36 trillion, respectively. This indicates that final demand for consumer products and locally produced goods remains high and is an integral part of the consumption of both tourists and local residents. This strengthens the argument that tourism sector development has a broad impact on the regional economy, both directly and indirectly, through final consumption. Therefore, strategies to strengthen tourism-supporting sectors need to be continuously implemented so that final consumption growth can create a sustainable and equitable multiplier effect across Bali's various economic sectors.

The multiplier effect is an economic concept that explains how a change in final demand in one sector can have a ripple effect

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on the entire economy. This concept is important because each economic activity does not exist in isolation but is interconnected within a complex production system. When final demand for a sector's products increases, that sector will increase its production, which in turn drives demand for inputs from other sectors. This process continues, producing a ripple effect (multiplier effect) that spreads throughout the economy. Calculating the output multiplier provides an indication of how much influence a sector has on total economic output when there is an increase in final demand. The higher the multiplier, the greater the ripple effect of that sector on other sectors in the economy (Miller & Blair, 2009).

Table 4 Output Multiplier Effect Value

Description	Code	Multiplier
Agriculture, Forestry, and Fisheries	A	1,160029
Mining and Quarrying	B	1,186155
Processing Industry	C	1,434313
Electricity and Gas Procurement	D	2,283078
Water Supply, Waste Management, and Recycling	E	1,296966
Construction	F	1,407418
Wholesale and Retail Trade; Automobile and Motorcycle Repair	G	1,286623
Transportation and Warehousing	H	1,406687
Provision of Accommodation and Food and Beverages	I	1,303296
Information and Communication	J	1,463964
Financial Services and Insurance	K	1,19539
Real Estate	L	1,288252
Company Services	MN	1,468892
Government Administration, Defense, and Mandatory Social Security	O	1,427555
Education Services	P	1,262477
Health Services and Social Activities	Q	1,270185
Other Services	RSTU	1,36356

Source: Data processing result, 2025

Based on the estimated 2024 Bali Province Input-Output Table—updated from the 2016 IO Table using the RAS method—there are variations in output multiplier values across 17 economic sectors. Among these sectors, the Accommodation and Food and Beverage Service sector, which is the core of the tourism sector, recorded a multiplier value of 1.303. This indicates that every 1 million Rupiah increase in final demand for this sector will generate an additional total output of 1.303 million Rupiah in the economy. This position places the tourism sector in the upper-middle category in terms of its ability to create economic chain effects, primarily through demand for food, energy, transportation, and other service sectors.

Compared to other sectors, the tourism sector's output multiplier is higher than primary sectors such as agriculture, and social services sectors such as education and health, but is still below strategic sectors such as electricity and gas supply (2.283), business services (1.469), and information and communication (1.464). This shows that the tourism sector has great potential to be a driving force for the economy, but to optimize this role, efforts are needed to increase upstream-downstream integration and strengthen derivative products that can encourage broader sectoral linkages. In addition, the Transportation and Warehousing sector, which also supports tourism, recorded a multiplier of 1.4067, while the Other Services sector, which also includes tourism-related cultural and entertainment activities, reached 1.3635. These values indicate that tourism-supporting sectors make a significant contribution to the economy through their linkage effects.

In comparison, the agriculture sector has the lowest multiplier effect at 1.16, reflecting its relatively small sectoral linkage structure compared to modern service sectors such as tourism. This aligns with Bali's current economic structure, which is dominated by the tertiary sector, particularly tourism services, which contributes the largest portion to Gross Regional Domestic Product (GRDP). Data from the Bali Provincial Statistics Agency (BPS) shows that in 2024, the accommodation and food and beverage sector contributed more than 20% to Bali's GRDP at current prices, highlighting its crucial role in driving post-pandemic economic recovery (BPS Bali, 2024). This analysis confirms that the tourism sector and its supporting sectors play a strategic role in driving Bali's economy. The substantial multiplier effect indicates that development and policies directed at the tourism sector not only have a direct impact on the sector but also have significant

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ripple effects on other sectors.

Backward linkages are a key indicator in Input-Output Table analysis, illustrating how much a sector relies on other sectors to meet its input needs in the production process. The higher the backward linkages of a sector, the greater the sector's impact on increasing economic activity in other sectors that supply inputs. Thus, backward linkages reflect a sector's ability to create a multiplier effect within the economic system. Category correlation value range is >1,10 (High), 0,90 -1,10 (Medium), <0,90 (Low).

Table 5 The Backward Linkage Value of Bali's I-O Table in 2024 Estimated

Description	Code	Linkage Backward total	Linkage
Agriculture, Forestry, and Fisheries	A	0,838997	Low
Mining and Quarrying	B	0,857893	Low
Processing Industry	C	1,037375	High
Electricity and Gas Procurement	D	1,651248	High
Water Supply, Waste Management, and Recycling	E	0,938037	Low
Construction	F	1,017923	High
Wholesale and Retail Trade; Automobile and Motorcycle Repair	G	0,930557	Low
Transportation and Warehousing	H	1,017394	High
Provision of Accommodation and Food and Beverages	I	0,942616	Low
Information and Communication	J	1,05882	High
Financial Services and Insurance	K	0,864572	Low
Real Estate	L	0,931735	Low
Company Services	MN	1,062384	High
Government Administration, Defense, and Mandatory Social Security	O	1,032486	Low
Education Services	P	0,913093	Low
Health Services and Social Activities	Q	0,918668	Low
Other Services	RSTU	0,986202	Low

Source: Data processing result, 2025

Based on the Table the highest backward linkage is found in Electricity and Gas Procurement, with an index of 1.6512. This indicates that this sector is highly dependent on the supply of goods and services from other sectors, including equipment, secondary energy, and technical support services. This is followed by the Corporate Services sector (1.0624), Information and Communications (1.0588), and Manufacturing (1.0374), all of which indicate that their production activities are closely linked to the involvement of other sectors as input suppliers. These sectors have significant potential to drive broader economic activity, as any increase in their output will trigger demand for other sectors in the production chain. Meanwhile, the Accommodation and Food and Beverage sector, a key component of tourism activity in Bali, had a backward linkage index of 0.9426, below average. This finding indicates that production activities in the tourism sector are relatively self-sufficient, relying on goods and services that do not originate from the broader domestic supply chain. The Transportation and Warehousing sector (index 1.0174) demonstrates high backward linkages and is strategic in supporting tourist movement, hotel and restaurant logistics distribution, and accessibility between tourist destinations. Without adequate transportation, tourist mobility will be hampered, making this sector a key backbone of Bali's tourism ecosystem.

Forward linkages measure the extent to which a sector's output is used as input by other sectors in the production process. The higher the forward linkages, the greater the sector's contribution to supporting the economic activity of other sectors.

Table 6 Future Linkage Value I-O Table 2024 Estimate

Description	Code	Linkage Future total	Linkage
Agriculture, Forestry, and Fisheries	A	1,087217	High
Mining and Quarrying	B	1,269518	High
Processing Industry	C	0,911218	0

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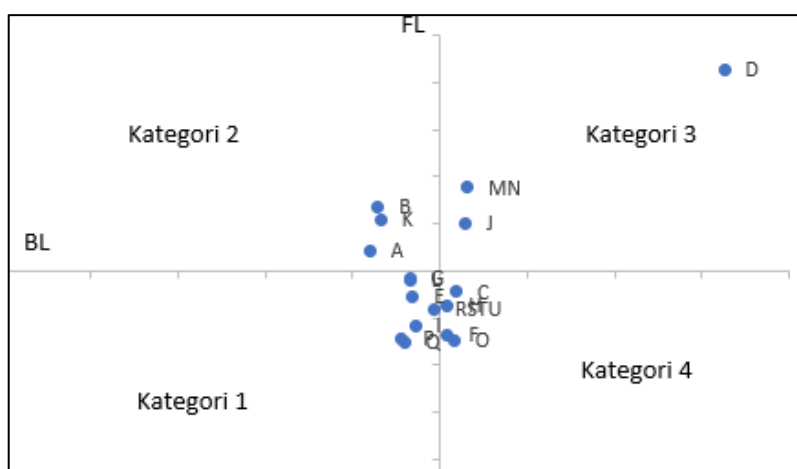
Electricity and Gas Procurement	D	1,856058	High
Water Supply, Waste Management, and Recycling	E	0,889431	0
Construction	F	0,725332	0
Wholesale and Retail Trade; Automobile and Motorcycle Repair	G	0,971741	0
Transportation and Warehousing	H	0,851568	0
Provision of Accommodation and Food and Beverages	I	0,76452	0
Information and Communication	J	1,199767	High
Financial Services and Insurance	K	1,215033	High
Real Estate	L	0,959603	0
Company Services	MN	1,352015	High
Government Administration, Defense, and Mandatory Social Security	O	0,70503	0
Education Services	P	0,709879	0
Health Services and Social Activities	Q	0,694811	0
Other Services	RSTU	0,837257	0

Source: Data processing result, 2025

The Accommodation and Food and Beverage Provision sector (code I) is a key sector in tourism activities in Bali Province. However, based on the normalized forward linkage calculation from the 2024 Input-Output Table, this sector has a forward linkage index of 0.7645, which is below average (index <1). This means that the output from this sector is not widely used as input by other. This indicates that the tourism sector, particularly this sectors is more final demand-oriented, meaning its output is consumed directly by tourists or households without undergoing further production processes in other sectors. This aligns with the characteristics of tourism as a service sector, whose output is not reused but rather consumed directly by the end consumer.

Nevertheless, this sector remains vital to Bali's economy, as it is the primary driver of final demand absorption, which in turn creates indirect demand for other sectors. This means that, despite its low forward linkages, it still has significant backward impacts, driving activity in input-providing sectors such as agriculture (food), trade (goods distribution), and transportation (tourist accessibility).

A key sector is one that has strong linkages with other sectors, both in terms of input demand (backward linkages) and input supply (forward linkages). In other words, this sector not only drives production activity in other sectors but also heavily depends on the continuity of other sectors in carrying out their production processes.



Source: Data processing result, 2025

Figure 1 Key Sector Mapping

Conceptually, a key sector is defined as a sector with higher forward and backward linkages than the average for all sectors, as expressed through a normalized linkage index (Miller & Blair, 2009). An index value above 1 indicates that the sector has above-

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average sectoral linkages and has the potential to generate broad multiplier effects on the economy. The sector that best represents tourism activities in the Input-Output Table is the Provision of Accommodation and Food and Beverages (I). Based on the calculation results: $BL = 0.9426$ $FL = 0.7645$

IV. CONCLUSION

Analysis of the Input-Output Table for Bali Province in 2024 using the RAS method shows that the tourism sector—represented by the Accommodation and Food and Beverage sectors—has a significant ripple effect on the Balinese economy. However, this sector has not yet been able to absorb the maximum workforce. In addition, the tourism sector also plays a dominant role in the final demand structure in Bali Province, contributing the highest gross added value (GVA) compared to 17 other main sectors, namely IDR 63.91 trillion or 21.4% of the total GVA.

Based on the findings and approaches used, this study has limitations that need to be considered because focuses on data from the Central Statistics Agency, so that further research can emphasize more in-depth investigations in terms of diversification of Tourism Products that can increase the contribution of the tourism sector to the local economy and expand the reach of its links, as well as integrate the tourism sector with other sectors both through human resource training and technological innovation through monitoring and evaluation based on Input-Output data. For more precise economic planning, the Bali Regional Government is advised to continue to update the Input-Output Table periodically. In addition, the use of the Bali Tourism Satellite Account (BTSA) needs to be improved so that tourism sector policies can be studied more comprehensively and integrated with other regional development.

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