



World Tourism Organization
International Network
of Sustainable Tourism
Observatories

ANNUAL REPORT 2024
MONITORING CENTRE FOR SUSTAINABLE TOURISM
OBSERVATORIES INSTO AND WINSTO
UNIVERSITAS SUMATERA UTARA
LAKE TOBA – Indonesia

1. Introduction

The Universitas Sumatera Utara (USU) Monitoring Centre for Sustainable Tourism Observatories (MCSTO) has been actively contributing to the sustainable development of tourism in Lake Toba since becoming a member of the UNWTO International Network of Sustainable Tourism Observatories (INSTO) in 2017. Initially, MCSTO USU focused its monitoring efforts on four villages in Pangururan Subdistrict, Samosir, before expanding in 2019 to cover thirty-one sub-districts, including both non-Key Tourism Areas (non-KTA) and Key Tourism Areas (KTA). This initiative aims to provide data-driven insights to support the achievement of Sustainable Development Goals (SDGs) and ensure that tourism development in the region remains sustainable and beneficial for local communities.

In 2023, MCSTO USU remains committed to enhancing its monitoring capabilities and contributing to global sustainable tourism initiatives. This year, the observatory expanded its focus from ten sustainability indicators: (1) Local satisfaction with tourism; (2) Destination economic benefits; (3) Employment; (4) Tourism seasonality; (5) Energy management; (6) Water management; (7) Wastewater management; (8) Solid waste management; (9) Governance; to a broader 11 indicators, including (10) Climate change, and (11) Accessibility, replacing community participation in tourism. These efforts align with UNWTO's sustainability framework and support government strategies in fostering a more resilient and responsible tourism sector in Lake Toba.

2. Destination Profile

DESTINATION PROFILE			
		2022	2023
1	Tourism Satellite Account/s (TSA) in the destination country	☒ YES Last time a TSA was conducted:	☒ YES Last time a TSA was conducted:
2	Sector relevance: Contribution of (a) tourism and (b) other economic sectors to the local GDP (%) – latest figures	a) Tourism 2,04% b) Agriculture 22,98% c) Industry 19,13% Source: BPS of North Sumatera	a) Tourism 3,12% b) Agriculture 31,07% c) Industry 29,73% Source: BPS of North Sumatera
3	Arrivals of inbound (non-resident) visitors for last three years	☒ YES North Sumatera 2022 : 74.498 2021: 230 2020: 44.400 Lake Toba Region 2022 : No Data 2021: No Data 2020: 297 Source: BPS of North Sumatera	☒ YES North Sumatera 2023 : 93.312 2022: 74.498 2021: 230 Lake Toba Region 2022 : No Data 2021: No Data 2020: No Data Source: BPS of North Sumatera
3.1	Percentage of total annual arrivals of inbound (non-resident) visitors occurring in peak month and in peak quarter (please indicate which month and quarter)	☒ YES 2022 = 3.214 in January, 6.317 in June, and 19.198 in December. (Source: BPS of North Sumatera)	☒ YES 2023 = 14.195 in January, 16.667 in June, and 18.440 in December. (Source: BPS of North Sumatera)
4	Trips of domestic visitors for the last three years	☒ YES Lake Toba Region 2022 : 1.031.594 2021: 201.335 2020: 217.462 Source: BPS of Toba Region	☒ YES Lake Toba Region 2023 : 2.197.015 2022: 1.031.594 2021: 201.335 Source: BPS of Toba Region

DESTINATION PROFILE			
		2022	2023
5	Tourism industries: accommodation for visitors in hotel and similar establishments - Units	☒ YES North Sumatera Total rooms: 33.580 Total bed-space: 48.164 Lake Toba Region Total rooms: 818 Total bed-places: 1.350 Source: BPS of North Sumatera	☒ YES North Sumatera Total rooms: 47.012 Total bed-space: 67.429 Lake Toba Region Total rooms: 1.636 Total bed-places: 2.700 Source: BPS of North Sumatera
6	Current top 5 primary source markets for the destination	☒ YES Malaysia Singapore Germany Australia Netherlands United States of America	☒ YES Malaysia Singapore China Thailand The United States of America Australia
7	Research & Journal related to Sustainable Tourism	Research & Journal : 26	Research & Journal : 46
8	Please describe the destination's experience with other monitoring initiatives/systems	In 2022, the monitoring continues on the whole lake's surroundings, which consists of 4 sub-districts.	In 2023, the monitoring continues on the whole lake's surroundings, which consists of 4 sub-districts.
9	Are there strategies in place for sustainable development of the destination?	☒ YES Name of those of relevance: STDev program of the Indonesian Ministry of Tourism.	☒ YES Name of those of relevance: STDev program of the Indonesian Ministry of Tourism.
10	DMO(s) in monitoring area: Yes/No and year of establishment	☒ YES Year of establishment: Badan Pelaksana Otorita Danau Toba / The Agency of Lake Toba Authority (2017); Badan Pengelola Geopark Kaldera Toba / The Management Board of Toba Caldera Geopark (2017)	☒ YES Year of establishment: Badan Pelaksana Otorita Danau Toba / The Agency of Lake Toba Authority (2017); Badan Pengelola Geopark Kaldera Toba / The Management Board of Toba Caldera Geopark (2017)

3. Findings, Reviews, and Performances of Issues and Indicators

In the current academic year, the MCSTO of USU has undertaken a comprehensive examination of eleven distinct domains through socialization/FGD, monitoring, observation, and analysis: Economic Benefits to the Destination, Employment, Seasonal Tourism, Governance, Local Satisfaction, Energy Management, Water Management, Liquid Waste Management, Solid Waste Management, Climate Change, and Accessibility.

3.1 Local Satisfaction

The level of local community satisfaction was monitored in 2022 and 2023 across four districts. The only increase in Satisfaction levels is observed in Pangururan (0,03 average points). Whereas, a significant change was recorded in Balige, with a decline of -0,87 average points. Overall, on a 5-point Likert scale, local communities in each district remain satisfied with tourism in their areas, despite slight decreases in Girsang Sipangan Bolon and Balige.

Simanindo

No.	Monitoring Issue	Baseline Indicator	Unit	Value		
				2021	2022	2023
1	Local Satisfaction	Level of satisfaction of local people with tourism	Likert scale average	No Data	3,93	3,93

Girsang Sipangan Bolon

No.	Monitoring Issue	Baseline Indicator	Unit	Value		
				2021	2022	2023
1	Local Satisfaction	Level of satisfaction of local people with tourism	Likert scale average	No Data	3,8	3,3

Pangururan

No.	Monitoring Issue	Baseline Indicator	Unit	Value		
				2021	2022	2023
1	Local Satisfaction	Level of satisfaction of local people with tourism	Likert scale average	No Data	3,97	4

Balige

No.	Monitoring Issue	Baseline Indicator	Unit	Value		
				2021	2022	2023
1	Local Satisfaction	Level of satisfaction of local people with tourism	Likert scale average	No Data	4,27	3,4

Source: Observatory Report

3.2 Economic Benefits to the Destination

The economic benefits of the tourism sector across the four main regions surrounding Lake Toba vary in terms of growth and challenges. Each district has experienced an increase in the number of Tourism Services in 2023, after being stagnant throughout 2021-2022. In Simanindo, the number of tourism services and tourism objects managed by non-government increased by three units, whereas the number of lodging declined by three units, resulting in a total decrease of 71 rented rooms. On the other hand, Girsang Sipangan Bolon experienced a growth in the number of travel agencies (4 units) and an increase of 225 rooms for rent, despite a sharp decline of 27 lodging businesses from 2022 to 2023. Both Simanindo and Pangururan, being in the same regency, received a massive increase in the tourism sector development budget (66,59%), which accounted for 81,69% of the total local development budget.

Pangururan demonstrated stable economic progress, with the addition of 4 travel agencies and increases in both food establishments (55 units) and certified businesses (47 units). Meanwhile, in Balige, despite the absence of several data recorded, most indicators increased, with the highest being the total number of food establishments, which more than doubled in 2023. Overall, the tourism sector continues to generate varying economic impacts across regions, presenting unique challenges and opportunities for destination management.

Simanindo

No	Monitoring Issue	Baseline Indicator	Unit	Value		
				2021	2022	2023
2	Economic Benefits for Destinations	Number of Tourism Services (Bureau/Travel Agent)	Business unit	17	17	20
		Number of Tourism Objects managed by Non-Government	Business unit	21	21	24
		Number of Lodging (Hotel, Cottage, Guesthouse, Villa Motel)	Business unit	90	88	85
		Total number of rooms for rent (room)	Room	1.647	1.776	1.705
		The number of Food Business Places (restaurants, Café, etc.)	Business unit	77	77	77
		Number of certified/ licensed Lodging, Dining, and Tourist Attractions	Business unit	191	189	186
		Local Gross Regional Domestic Product (GDP)	Rp	4.755.230.000	5.166.230.000	5.166.250.000
		Gross Regional Domestic Product (GDP) from the Tourism sector	Rp	232.900.000	253.770.000	No Data
		Total local development budget	Rp	8.796.456.862	8.556.972.913	8.980.674.905
		Development budget in support of the tourism sector	Rp	3.412.470.944	4.403.926.537	7.336.499.388

Girsang Sipangan Bolon

No	Monitoring Issue	Baseline Indicator	Unit	Value		
				2021	2022	2023
2	Economic Benefits for Destinations	Number of Tourism Services (Bureau/Travel Agent)	Business unit	5	5	9
		Number of Tourism Objects managed by Non-Government	Business unit	18	18	12
		Number of Lodging (Hotel, Cottage, Guesthouse, Villa Motel)	Business unit	74	83	56
		Total number of rooms for rent (room)	Room	No Data	1.772	1.997
		The number of Food Business Places (restaurants, Café, etc.)	Business unit	No Data	No Data	623

No	Monitoring Issue	Baseline Indicator	Unit	Value		
				2021	2022	2023
		Number of certified/ licensed Lodging, Dining, and Tourist Attractions	Business unit	71	71	71
		Local Gross Regional Domestic Product (GDP)	Rp	42.576.000.000	47.285.890.000	No Data
		Gross Regional Domestic Product (GDP) from the Tourism sector	Rp	335.350.000	359.920.000	No Data
		Total local development budget	Rp	No Data	No Data	No Data
		Development budget in support of the tourism sector	Rp	No Data	No Data	19.300.047.271

Pangururan

No	Monitoring Issue	Baseline Indicator	Unit	Value		
				2021	2022	2023
2	Economic Benefits for Destinations	Number of Tourism Services (Bureau/Travel Agent)	Business unit	9	11	15
		Number of Tourism Objects managed by Non-Government	Business unit	11	11	11
		Number of Lodging (Hotel, Cottage, Guesthouse, Villa Motel)	Business unit	42	127	127
		Total number of rooms for rent (room)	Room	505	571	568
		The number of Food Business Places (restaurants, Café, etc.)	Business unit	375	429	486
		Number of certified/ licensed Lodging, Dining, and Tourist Attractions	Business unit	428	567	624
		Local Gross Regional Domestic Product (GDP)	Rp	4.542.850.000	4.755.230.000	5.166.250.000
		Gross Regional Domestic Product (GDP) from the Tourism sector	Rp	No Data	No Data	No Data
		Total local development budget	Rp	8.796.456.862	8.556.972.913	8.980.674.905
		Development budget in support of the tourism sector	Rp	3.412.470.944	4.403.926.537	7.336.499.388

Balige

No	Monitoring Issue	Baseline Indicator	Unit	Value		
				2021	2022	2023
2	Economic Benefits for Destinations	Number of Tourism Services (Bureau/Travel Agent)	Business unit	15	15	20
		Number of Tourism Objects managed by Non-Government	Business unit	18	18	18
		Number of Lodging (Hotel, Cottage, Guesthouse, Villa Motel)	Business unit	30	40	48

No	Monitoring Issue	Baseline Indicator	Unit	Value		
				2021	2022	2023
		Total number of rooms for rent (room)	Room	417	542	763
		The number of Food Business Places (restaurants, Café, etc.)	Business unit	94	102	239
		Number of certified/ licensed Lodging, Dining, and Tourist Attractions	Business unit	No Data	No Data	No Data
		Local Gross Regional Domestic Product (GDP)	Rp	5.649.100.000	5.888.370.000	5.888.380.000
		Gross Regional Domestic Product (GDP) from the Tourism sector	Rp	No Data	No Data	No Data
		Total local development budget	Rp	No Data	No Data	No Data
		Development budget in support of the tourism sector	Rp	14.549.286.980	No Data	No Data

Source: BPS of North Sumatra

3.3 Employment

Employment trends in the tourism sector vary across the monitored regions. In Simanindo, the total number of workers in the tourism sector increased by 19,35%, but the number of female workers in the sector declined by -16,17%, and tourists' perception of worker services also decreased by 0,65 from 2022 to 2023. Girsang Sipangan Bolon exhibited higher workforce growth, with an overall increase of 39,21% and a 11,41% rise in female workers. Meanwhile, in Pangururan, tourists' perception of labor services increased by 0,45 in 2023. Balige saw a 10,33% increase in the tourism sector workforce; however, the number of female workers decreased by -8,73%. These data indicate that while the workforce is increasing in some areas, this increase does not correlate directly with female worker participation. However, the data remains insufficient, hindering efforts to improve the quality of employment in the tourism sector.

Simanindo

No	Monitoring Issue	Baseline Indicator	Unit	Value		
				2021	2022	2023
3	Employment	Total number of workers in the tourism sector	Person	21.574	19.901	23.752
		Number of local people working in the tourism sector	Person	19.896	18.353	21.904
		Number of female workers in the tourism sector	Person	11.844	11.018	9.236
		Tourist perceptions of worker services in the tourism sector	Likert scale average	3,34	3,9	3,25

Girsang Sipangan Bolon

No	Monitoring Issue	Baseline Indicator	Unit	Value		
				2021	2022	2023
3	Employment	Total number of workers in the tourism sector	Person	449.676	456.080	634.901
		Number of local people working in the tourism sector	Person	414.691	420.597	609.251

		Number of female workers in the tourism sector	Person	188.351	191.704	213.570
		Tourist perceptions of worker services in the tourism sector	Likert scale average	No Data	No Data	No Data

Pangururan

No	Monitoring Issue	Baseline Indicator	Unit	Value		
				2021	2022	2023
3	Employment	Total number of workers in the tourism sector	Person	No Data	No Data	No Data
		Number of local people working in the tourism sector	Person	No Data	No Data	No Data
		Number of female workers in the tourism sector	Person	No Data	No Data	No Data
		Tourist perceptions of worker services in the tourism sector	Likert scale average	3,34	3,79	4,24

Balige

No.	Monitoring Issue	Baseline Indicator	Unit	Value		
				2021	2022	2023
3	Employment	Total number of workers in the tourism sector	Person	No Data	34.367	37.917
		Number of local people working in the tourism sector	Person	No Data	30.916	34.110
		Number of female workers in the tourism sector	Person	No Data	23.940	21.849
		Tourist perceptions of worker services in the tourism sector	Likert scale average	No Data	No Data	No Data

Source: BPS of North Sumatra

3.4 Seasonal Tourism

Seasonal tourism trends across various districts exhibit an increase in visitation patterns. Simanindo recorded a 29,24% increase in domestic tourist visits and a surge in international tourists after none in 2022, with tourist perceptions of seasonal tourism increasing by 0,18. Girsang Sipangan Bolon showed a higher growth rate in domestic tourist visits, but missing data on foreign tourist visits. In Pangururan, despite the rising number of domestic tourists by 50%, as well as international tourist visits (50,05%), it experienced a decline of 0,26 in tourist perceptions of seasonal tourism. Meanwhile, Balige nearly quadrupled the number of domestic tourists in 2023 but recorded no international tourist visits. Room occupancy in Simanindo and Pangururan remained the same for three years, despite the increase of visitors. Overall, these data highlight differences in tourist visitation patterns across regions, with some areas experiencing a surge in international tourists, while others remain more reliant on domestic visitors.

Simanindo

No	Monitoring Issue	Baseline Indicator	Unit	Value		
				2021	2022	2023
4	Seasonal Tourism	Domestic tourists visit	Person	402.295	663.848	857.939
		Number of foreign tourist visits	Person	2.908	0	2.953
		The average number of rooms occupied by tourists per month	%	15,17	15,17	15,17

		Tourist perception of seasonal tourism	Likert scale average	No Data	3,82	4
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Girsang Sipangan Bolon

No	Monitoring Issue	Baseline Indicator	Unit	Value		
				2021	2022	2023
4	Seasonal Tourism	Domestic tourists visit	Person	717.714	1.102.567	2.487.529
		Number of foreign tourist visits	Person	44.746	No Data	No Data
		The average number of rooms occupied by tourists per month	%	11,02	24,77	23,01
		Tourist perception of seasonal tourism	Likert scale average	No Data	No Data	3,2

Pangururan

No	Monitoring Issue	Baseline Indicator	Unit	Value		
				2021	2022	2023
4	Seasonal Tourism	Domestic tourists visit	Person	442.565	571.959	857.939
		Number of foreign tourist visits	Person	0	1.968	2.953
		The average number of rooms occupied by tourists per month	%	15,17	15,17	15,17
		Tourist perception of seasonal tourism	Likert scale average	No Data	3,91	3,65

Balige

No	Monitoring Issue	Baseline Indicator	Unit	Value		
				2021	2022	2023
4	Seasonal Tourism	Domestic tourists visit	Person	100.667	515.797	2.079.369
		Number of foreign tourist visits	Person	0	0	0
		The average number of rooms occupied by tourists per month	%	20,45	29,33	No Data
		Tourist perception of seasonal tourism	Likert scale average	No Data	No Data	3,2

Source: BPS of North Sumatra

3.5 Governance

Sustainable tourism governance across regions reflects the implementation of long-term destination development strategies, despite execution challenges. Each district has established a long-term development plan; however, the number of organizations responsible for sustainable tourism management has not increased since 2021, with Balige having the most support of seven organizations. The number of tourism monitoring activities in Simanindo and Girsang Sipangan Bolon has declined to 5 and 1 activities, respectively, whereas the number of education activities on climate change has increased to 5 activities. On the other hand, Pangururan has recorded the opposite trend: the government increased monitoring activities in 2023 but decreased the number of climate change education activities. Additionally, no changes in assets or tourist attractions have been recorded in any district. These data indicate that while efforts in tourism governance are evident, challenges such as organizational coordination and continuous monitoring still require improvement.

Simanindo

No	Monitoring Issue	Baseline Indicator	Unit	Value		
				2021	2022	2023
5	Governance	Multi-year destination development plan or strategy	Yes/No	Yes	Yes	Yes
		Number of organisations responsible for coordinating the management of sustainable tourism	Organisation	4	4	4
		Number of tourism monitoring in one year	Activity	4	7	5
		Number of climate change education activities in one year	Activity	3	3	5
		Number of assets and tourist attractions inventoried	Object	23	23	23
		Number of tourism promotion activities in one year	Activity	12	21	26

Girsang Sipangan Bolon

No	Monitoring Issue	Baseline Indicator	Unit	Value		
				2021	2022	2023
5	Governance	Multi-year destination development plan or strategy	Yes/No	Yes	Yes	Yes
		Number of organisations responsible for coordinating the management of sustainable tourism	Organisation	4	4	No Data
		Number of tourism monitoring in one year	Activity	4	4	1
		Number of climate change education activities in one year	Activity	0	1	5
		Number of assets and tourist attractions inventoried	Object	23	23	23
		Number of tourism promotion activities in one year	Activity	6	6	No Data

Pangururan

No	Monitoring Issue	Baseline Indicator	Unit	Value		
				2021	2022	2023
5	Governance	Multi-year destination development plan or strategy	Yes/No	Yes	Yes	Yes
		Number of organisations responsible for coordinating the management of sustainable tourism	Organisation	4	4	4
		Number of tourism monitoring in one year	Activity	5	5	6
		Number of climate change education activities in one year	Activity	2	4	3
		Number of assets and tourist attractions inventoried	Object	5	5	5
		Number of tourism promotion activities in one year	Activity	10	8	29

Balige

No	Monitoring Issue	Baseline Indicator	Unit	Value		
				2021	2022	2023
5	Governance	Multi-year destination development plan or strategy	Yes/No	Yes	Yes	Yes
		Number of organisations responsible for coordinating the management of sustainable tourism	Organisation	7	7	7
		Number of tourism monitoring in one year	Activity	No Data	No Data	No Data
		Number of climate change education activities in one year	Activity	No Data	No Data	No Data
		Number of assets and tourist attractions inventoried	Object	No Data	No Data	13
		Number of tourism promotion activities in one year	Activity	No Data	No Data	No Data

Source: BPS of North Sumatra

3.6 Energy Management

Energy management in the tourism sector across various regions exhibits relatively uniform consumption patterns, with limited adoption of renewable energy. Simanindo and Pangururan have a daily energy consumption rate of 0.42 kWh per person per hour in 2023, with two and one business units utilizing renewable energy in each district, respectively. Girsang Sipangan Bolon has a significantly higher energy consumption of 3.29 kWh per person per hour. Meanwhile, Balige records the highest daily energy consumption (3.68 kWh per person per hour), yet no data is retrievable on the number of businesses that have transitioned to renewable energy. These data indicate that while energy consumption remains stable across all regions, the use of renewable energy is still minimal. Therefore, further efforts are needed to promote the adoption of environmentally friendly energy sources in the tourism sector.

Simanindo

No	Monitoring Issue	Baseline Indicator	Unit	Value		
				2021	2022	2023
6	Energy Management	Energy Consumption in a day	kWh/Org/Hr	0,46	0,48	0,42
		Number of business units participating in energy conservation programs	Business Unit	0	0	No Data
		Number of business units in the tourism sector that use energy from renewable resources	Business Unit	2	2	2

Girsang Sipangan Bolon

No	Monitoring Issue	Baseline Indicator	Unit	Value		
				2021	2022	2023
6	Energy Management	Energy Consumption in a day	kWh/Org/Hr	2,36	2,38	3,29
		Number of business units participating in energy conservation programs	Business Unit	0	0	0
		Number of business units in the tourism sector that use energy from renewable resources	Business Unit	2	1	2

Pangururan

No	Monitoring Issue	Baseline Indicator	Unit	Value		
				2021	2022	2023
6	Energy Management	Energy Consumption in a day	kWh/Org/Hr	0,46	0,48	0,42
		Number of business units participating in energy conservation programs	Business Unit	1	1	1
		Number of business units in the tourism sector that use energy from renewable resources	Business Unit	1	1	1

Balige

No	Monitoring Issue	Baseline Indicator	Unit	Value		
				2021	2022	2023
6	Energy Management	Energy Consumption in a day	kWh/Org/Hr	2,55	2,83	3,68
		Number of business units participating in energy conservation programs	Business Unit	No Data	No Data	No Data
		Number of business units in the tourism sector that use energy from renewable resources	Business Unit	0	0	No Data

Source: BPS of North Sumatra

3.7 Water Management

Water management in the tourism sector across various regions varies in terms of consumption, access to clean water, and the use of recycled water. Each district experienced slight decreases in daily water use in 2023, with Girsang Sipangan Bolon recording the most significant decline of 3.28% (from 122 to 118 liters per day). Whereas Simanindo reported a daily clean water consumption of 130, Pangururan reported 131, and Balige reported 129. However, the limited data across destinations makes it challenging to evaluate improvements or setbacks.

Simanindo

No	Monitoring Issue	Baseline Indicator	Unit	Value		
				2021	2022	2023
7	Water Management	Daily use of clean water	Litres/Person /Day	139	131	130
		Percentage of recycled water use	%	0	0	No Data
		Number of tourism facilities that have recycled water	Business unit	0	0	No Data
		Number of tourism facilities that already have access to clean drinking water	Business unit	0	0	No Data
		Travellers' Perceptions of Water Quality	Likert scale average	No Data	No Data	3,1

Girsang Sipangan Bolon

No	Monitoring Issue	Baseline Indicator	Unit	Value		
				2021	2022	2023
7	Water Management	Daily use of clean water	Litres/Person /Day	191	122	118
		Percentage of recycled water use	%	0	0	No Data

No	Monitoring Issue	Baseline Indicator	Unit	Value		
				2021	2022	2023
		Number of tourism facilities that have recycled water	Business unit	0	0	No Data
		Number of tourism facilities that already have access to clean drinking water	Business unit	53	53	53
		Travellers' Perceptions of Water Quality	Likert scale average	No Data	No Data	3,2

Pangururan

No	Monitoring Issue	Baseline Indicator	Unit	Value		
				2021	2022	2023
7	Water Management	Daily use of clean water	Litres/Person/Day	123	132	131
		Percentage of recycled water use	%	No Data	No Data	No Data
		Number of tourism facilities that have recycled water	Business unit	No Data	No Data	No Data
		Number of tourism facilities that already have access to clean drinking water	Business unit	No Data	No Data	No Data
		Travellers' Perceptions of Water Quality	Likert scale average	No Data	No Data	3,2

Balige

No	Monitoring Issue	Baseline Indicator	Unit	Value		
				2021	2022	2023
7	Water Management	Daily use of clean water	Litres/Person/Day	133	130	129
		Percentage of recycled water use	%	No Data	No Data	No Data
		Number of tourism facilities that have recycled water	Business unit	112	112	112
		Number of tourism facilities that already have access to clean drinking water	Business unit	No Data	No Data	No Data
		Travellers' Perceptions of Water Quality	Likert scale average	No Data	No Data	3,2

Source: BPS of North Sumatra

3.8 Liquid Waste Management

The data on liquid waste management from 2021 to 2023 reveal consistent treatment levels in Simanindo (639.36 L/day) and Pangururan (656.64 L/day), with 37 and 38 tourism business units, respectively, implementing water treatment systems. In contrast, Girsang Sipangan Bolon reports zero treatment, with only four businesses involved, and Balige shows no treatment data for 2023. The amount of generated liquid waste was unattainable in exact data; therefore, this report calculated the total amount per litres per day based on the number of visitors, hotel rooms, restaurants, and tourist facilities, by assuming of national standard waste output in tourist destinations. All districts reported a high amount of liquid waste generated by the tourism sector. This highlights the urgent need for more comprehensive and consistent data collection to support effective environmental management and sustainable tourism planning.

Simanindo

No	Monitoring Issue	Baseline Indicator	Unit	Value		
				2021	2022	2023
8	Liquid Waste Management	The amount of liquid waste from the tourism sector	Litres/Day	No Data	177.522,83	192.648,9
		The amount of liquid waste from the tourism sector receiving treatment (liquid waste treatment)	Litres/Day	639,36	639,36	639,36
		Number of business units in the tourism sector that implement a water treatment system	Business unit	37	37	37

Girsang Sipangan Bolon

No	Monitoring Issue	Baseline Indicator	Unit	Value		
				2021	2022	2023
8	Liquid Waste Management	The amount of liquid waste from the tourism sector	Litres/Day	No Data	No Data	465.978,44
		The amount of liquid waste from the tourism sector receiving treatment (liquid waste treatment)	Litres/Day	0	0	0
		Number of business units in the tourism sector that implement a water treatment system	Business unit	4	4	4

Pangururan

No	Monitoring Issue	Baseline Indicator	Unit	Value		
				2021	2022	2023
8	Liquid Waste Management	The amount of liquid waste from the tourism sector	Litres/Day	No Data	491.475	572.313,91
		The amount of liquid waste from the tourism sector receiving treatment (liquid waste treatment)	Litres/Day	656,64	656,64	656,64
		Number of business units in the tourism sector that implement a water treatment system	Business unit	38	38	38

Balige

No	Monitoring Issue	Baseline Indicator	Unit	Value		
				2021	2022	2023
8	Liquid Waste Management	The amount of liquid waste from the tourism sector	Litres/Day	No Data	165.174,32	448.221,16
		The amount of liquid waste from the tourism sector receiving treatment (liquid waste treatment)	Litres/Day	0.084	0.084	No Data
		Number of business units in the tourism sector that implement a water treatment system	Business unit	1	1	1

Source: BPS of North Sumatra

3.9 Solid Waste Management

Solid waste management in the tourism sector continues to face stagnancy in implementing waste segregation and recycling systems. Simanindo has two tourism-related businesses that practice waste segregation, but none have adopted waste recycling. Girsang Sipangan Bolon shows a more proactive approach, with six businesses implementing waste segregation; however, no businesses have engaged in recycling efforts. Pangururan has only one business practicing waste segregation, which is a decrease from two businesses in 2021, but tourists' perceptions of destination cleanliness increased by 0,26. Balige, despite having only one business practicing waste segregation, and ten businesses implementing waste recycling systems. These data indicate that while some efforts in waste segregation are in place, recycling practices remain highly limited and require further improvements to enhance environmental sustainability in the tourism sector. On the other hand, the amount of waste generated at each destination rose, with Balige more than doubling its waste output in 2023.

Simanindo

No	Monitoring Issue	Baseline Indicator	Unit	Value		
				2021	2022	2023
9	Solid Waste Management	The volume of waste generated by the destination	Tons/ Month	No Data	106,07	112,61
		Number of business units in the tourism sector that implement waste type segregation	Business unit	2	2	2
		Number of tourism sector business units that recycle waste	Business unit	0	0	0
		Tourist perceptions of the image of the cleanliness of the destination	Likert scale average	No Data	3,7	2,8

Girsang Sipangan Bolon

No	Monitoring Issue	Baseline Indicator	Unit	Value		
				2021	2022	2023
9	Solid Waste Management	The volume of waste generated by the destination	Tons/ Month	No Data	298,61	351,92
		Number of business units in the tourism sector that implement waste type segregation	Business unit	6	6	6
		Number of tourism sector business units that recycle waste	Business unit	0	0	0
		Tourist perceptions of the image of the cleanliness of the destination	Likert scale average	No Data	No Data	2,8

Pangururan

No	Monitoring Issue	Baseline Indicator	Unit	Value		
				2021	2022	2023
9	Solid Waste Management	The volume of waste generated by the destination	Tons/ Month	No Data	No Data	550,19
		Number of business units in the tourism sector that implement waste type segregation	Business unit	2	2	1
		Number of tourism sector business units that recycle waste	Business unit	No Data	No Data	No Data
		Tourist perceptions of the image of the cleanliness of the destination	Likert scale average	No Data	2,74	3

Balige

No	Monitoring Issue	Baseline Indicator	Unit	Value		
				2021	2022	2023
9	Solid Waste Management	The volume of waste generated by the destination	Tons/ Month	No Data	100,48	288,23
		Number of business units in the tourism sector that implement waste type segregation	Business unit	1	1	1
		Number of tourism sector business units that recycle waste	Business unit	10	10	10
		Tourist perceptions of the image of the cleanliness of the destination	Likert scale average	No Data	No Data	2,7

Source: BPS of North Sumatra

3.10 Climate Action

Climate action and the impact of extreme weather vary across regions, with tourist destinations in some regions more severely affected than others. Simanindo recorded 7 cases of damage caused by extreme weather, with 5 events of storms or flooding occurring annually. Girsang Sipangan Bolon recorded 9 cases of damage to tourist destinations, with 2 events of storms or floods. On the other hand, Pangururan reported the highest level of damage, with 19 cases attributed to climate change, despite a lower annual frequency of storms or floods, totalling 3 incidents. Meanwhile, Balige had the fewest damage cases, recording 4 incidents, with 4 storms or floods occurring annually. These data indicate that climate change and extreme weather significantly impact the sustainability of tourist destinations around Lake Toba. Therefore, enhanced mitigation and adaptation strategies are essential to minimize their effects.

Simanindo

No	Monitoring Issue	Baseline Indicator	Unit	Value		
				2021	2022	2023
10	Climate action	Damage to tourist destinations due to climate extremes	Business Unit	No Data	No Data	7
		Number of storm/flood events	Activity	0	No Data	5

Girsang Sipangan Bolon

No	Monitoring Issue	Baseline Indicator	Unit	Value		
				2021	2022	2023
10	Climate action	Damage to tourist destinations due to climate extremes	Business Unit	No Data	No Data	9
		Number of natural disaster events	Activity	No Data	No Data	2

Pangururan

No	Monitoring Issue	Baseline Indicator	Unit	Value		
				2021	2022	2023
10	Climate action	Damage to tourist destinations due to climate extremes	Business Unit	5	22	19
		Number of natural disaster events	Activity	0	No Data	3

Balige

No	Monitoring Issue	Baseline Indicator	Unit	Value		
				2021	2022	2023
10	Climate action	Damage to tourist destinations due to climate extremes	Business Unit	No Data	No Data	4
		Number of natural disaster events	Activity	No Data	No Data	4

Source: BPS of North Sumatra

3.11 Accessibility

Accessibility in the tourism sector across various regions reflects the implementation of disability-friendly policies. The only data recorded in each district is the number of people with disabilities who visited each tourist destination. Balige had the most visitors, with 263 people, followed by Girsang Sipangan Bolon with 252 people, Pangururan with 83 people, and Simanindo with only 42. The figures presented are conservative estimates based on accommodation capacity, hotel occupancy rates, and destination characteristics, due to the absence of disability-based visitor data. A consistent, capacity-constrained approach was applied across destinations and years to avoid overestimation. While each district has established inclusive policies for people with disabilities and ensures the presence of medical personnel on tourist transportation. These data indicate that while awareness of accessibility is present across all regions, the lack of data on infrastructure and healthcare services makes it challenging to evaluate improvements or setbacks in accessibility within each district.

Simanindo

No	Monitoring Issue	Baseline Indicator	Unit	Value		
				2021	2022	2023
11	Accessibility	The existence of policies that are friendly to people with disabilities	Yes/No	Yes	Yes	Yes
		Number of associated hospital or medical facilities	Business unit	11	No Data	No Data
		Number of people with disabilities who visited the tourist destination	People	17	41	42
		Presence of medical personnel in tourist transportation	Yes/No	Yes	Yes	Yes

Girsang Sipangan Bolon

No	Monitoring Issue	Baseline Indicator	Unit	Value		
				2021	2022	2023
11	Accessibility	The existence of policies that are friendly to people with disabilities	Yes/No	Yes	Yes	Yes
		Number of associated hospital or medical facilities	Business unit	7	No Data	No Data
		Number of people with disabilities who visited the tourist destination	People	120	271	252
		Presence of medical personnel in tourist transportation	Yes/No	Yes	Yes	Yes

Pangururan

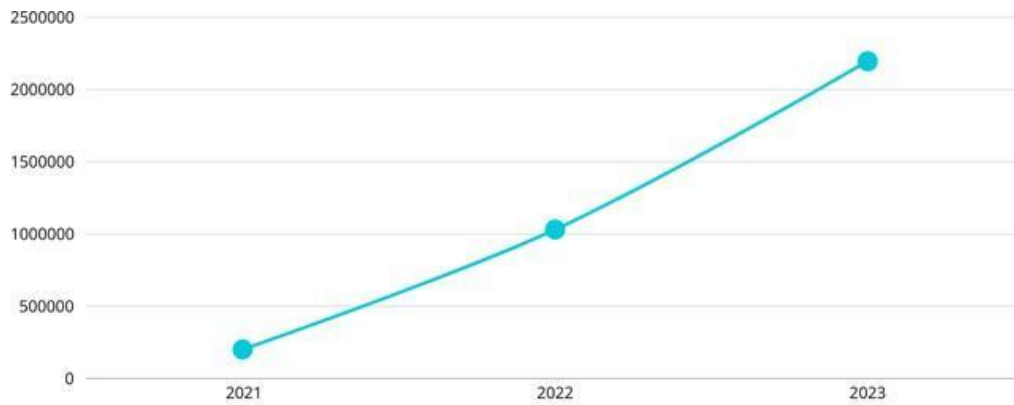
No	Monitoring Issue	Baseline Indicator	Unit	Value		
				2021	2022	2023
11	Accessibility	The existence of policies that are friendly to people with disabilities	Yes/No	Yes	Yes	Yes
		Number of associated hospital or medical facilities	Business unit	13	No Data	No Data
		Number of people with disabilities who visited the tourist destination	People	35	81	83
		Presence of medical personnel in tourist transportation	Yes/No	Yes	Yes	Yes

Balige

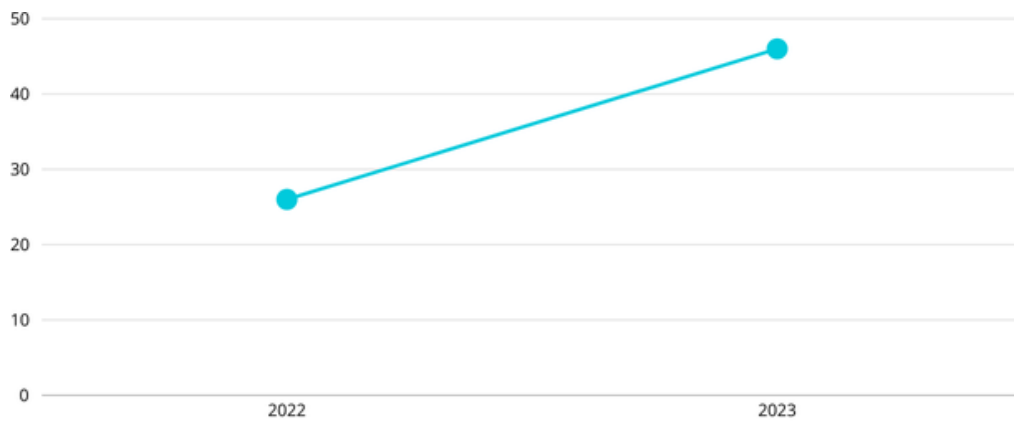
No	Monitoring Issue	Baseline Indicator	Unit	Value		
				2021	2022	2023
11	Accessibility	The existence of policies that are friendly to people with disabilities	Yes/No	Yes	Yes	Yes
		Number of associated hospital or medical facilities	Business unit	19	21	21
		Number of people with disabilities who visited the tourist destination	People	168	241	263
		Presence of medical personnel in tourist transportation	Yes/No	Yes	Yes	Yes

Source: BPS of North Sumatra

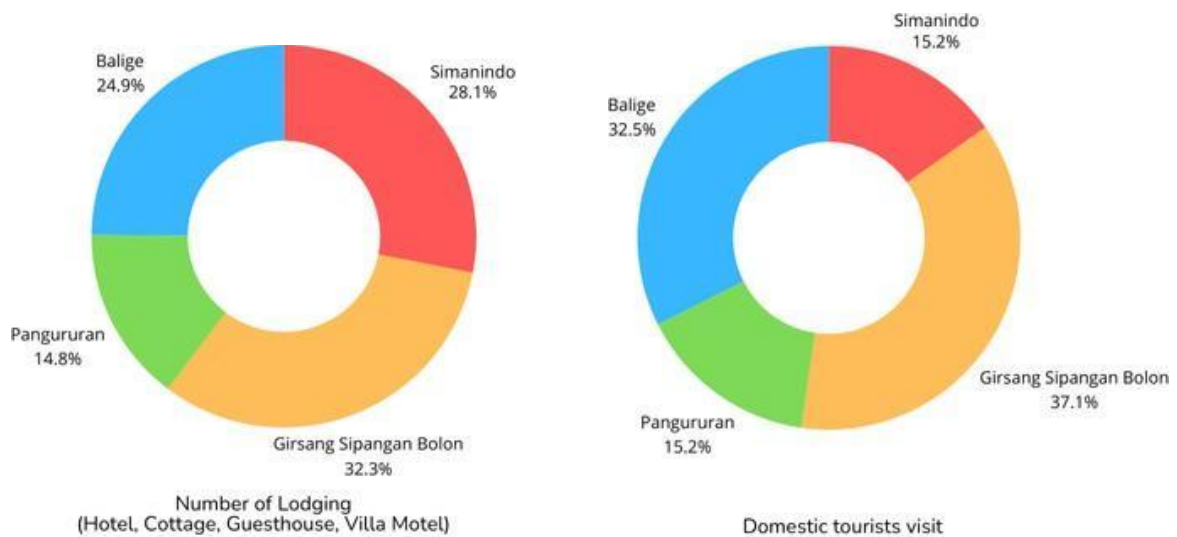
INFOGRAPHICS

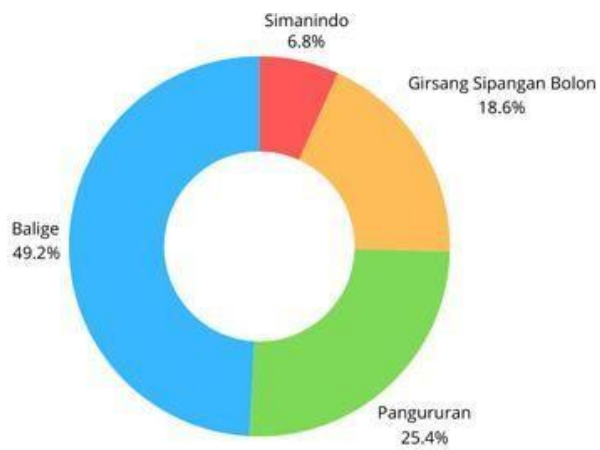


Trips of domestic visitors for the last three years

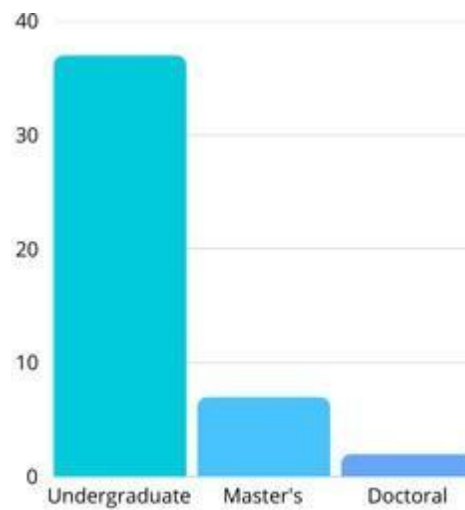


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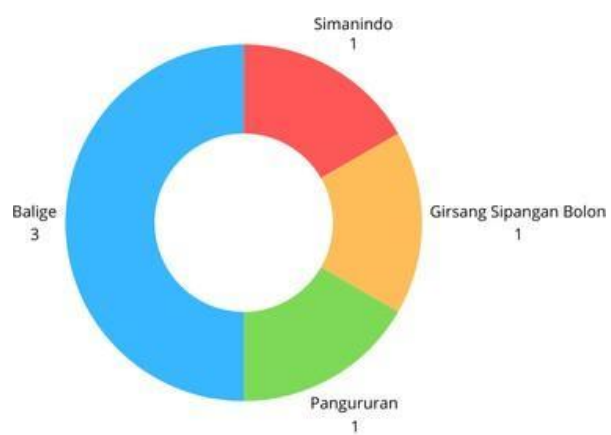




Total number of rooms for rent (room)



Student Research & Thesis



Student Research & Thesis



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