INTERNATIONAL SCIENTIFIC JOURNAL

Volume 28, Issue 3, 2024 | ISSN 1821-1127 (Online) | UDC: 338.48

UNIVERSITY OF NOVI SAD | FACULTY OF SCIENCES | DEPARTMENT OF GEOGRAPHY, TOURISM & HOTEL MANAGEMENT

TURIZAM

INTERNATIONAL SCIENTIFIC JOURNAL

VOLUME 28, ISSUE 3, 2024

ISSN 1821-1127 (Online) | UDC: 338.48

Content

TURIZAM
Volume 28, Issue 3
139–153 (2024)
ORIGINAL
SCIENTIFIC PAPER

Resident Opinions Towards Impacts of Cultural Heritage Tourism: a Case of Kullu Valley, Himachal Pradesh (India)

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Received: January 2024 | Accepted: October 2024
DOI: 10.5937/turizam28-48681

Abstract

Residents opinions are important for planning and sustainable cultural heritage tourism development at a destination. In the present study, data was collected through a structured questionnaire to know the opinions of local residents towards the socio-cultural and economic impacts of Cultural heritage tourism in Kullu valley. The results of the study highlight that local residents perceive cultural heritage tourism brings socio-cultural & economic benefits and support tourism development. Residents are also aware about the darker side of tourism development on the local community, culture and economy. Strong partnerships between local residents and tourism authorities are required for sustainable cultural heritage tourism development.

Keywords: *Cultural Heritage Tourism, Kullu valley, Residents opinions, Sustainable planning, Tourism impacts.*

Introduction

Tourism industry is one of the fastest growing industries across the globe. Tourism activities at different destinations have contributed to the economic growth of many nations (Lee, Chang, 2008; Telfer, Sharpley, 2015). Tourism industry contributed to about 9% to the global GDP according to UNWTO reports. Cultural heritage tourism activities around the world have supported local communities by creating opportunities for jobs and business. Many scholars have mentioned there is improvement in standard of living of local residents through tourism development as well as there is huge improvement in public infrastructure like road network, airports, rail network, hospitals and shopping areas etc (Sharma et al., 2012; Zaei et al., 2013). Cultural heritage tourism has also benefited local communities culturally. On the other hand, Tourism development also leads to negative impacts on the local communities (Látk-

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ová, Vogt, 2012; Jamal, Dredge, 2014). Problems like commodification of culture, over tourism, over pricing, conflict between the local residents and tourists may arise. Tourism development has helped in economic growth of destinations across the world. Though tourism development totally relies on the attitude and support of the local residents as their efforts and support is required for the growth, planning, smooth operations and sustainability of a particular destination (Godfrey, 1998). To know the opinions of residents about tourism growth in their area is important to get support from the residents for the development of tourism (Stylidis et al., 2014). Active community participation is an important part of sustainable tourism development.

Cultural heritage is considered as an important tourism resource for the growth and development of cultural heritage tourism across different tourism destinations in all parts of the world (McKercher, Du Cros, 2002; Landorf, 2009). Cultural heritage tourism is one of the major forms of tourism and can be categorized into special interest tourism. Cultural heritage tourism is one of the fastest growing forms of tourism across the world. Cultural heritage tourism plays an important role in offering immersive cultural experiences (Tscheu, Buhalis, 2016). It has been seen that cultural heritage tourism has seen a significant growth driven by its expanding applications into diverse industries. Technological advancements in the modern days have impacted the cultural heritage tourism market. Cultural heritage tourism is split into different forms of tourism like art tourism, heritage tourism, creative tourism, food tourism and festival tourism (Virginija, 2016). Cultural heritage tourism is growing at a great speed; it is projected that the direct global value of cultural heritage tourism is more than 1 billion USD with Asia Pacific being almost 327 million USD. More than 75 million jobs are created in the APEC countries. Cultural heritage tourism is attracting high yield tourists from all parts of the world to different destinations. Cultural heritage tourists often stay for a longer duration of time and spend a higher amount of money when compared with general tourists (O'Leary et al., 1998; Huh, 2002; Bowitz, Ibenholt, 2009).

Tourism is a mainstay of Himachal Pradesh economy. The twin destinations Kullu and Shimla accounted for 36% of total tourist arrivals which accounted for 15 million in the year 2022. Tourism industry contributes 7.5% to the state's gross domestic product. Around 13% of total employment and 133 million USD revenue is generated from the tourism sector.

Kullu valley is one of the most popular and culturally significant destinations in the state known for its ancient culture, grand heritage, rich customs and traditions (Sharma, 2015). Millions of tourists travel to various parts of Kullu valley each year with the aim to experience the culture and heritage which makes it one of the most visited places in the state of Himachal Pradesh. Tourism has created huge positive socio-cultural and economic impacts for the local residents, on the other hand large influx of tourists have also created several negative impacts in the valley. Tourism in Kullu valley has placed heavy pressure on various cultural tourist sites, which have started to produce negative impacts on the local architecture, buildings, customs & traditions, local community and natural environment. The present research paper addresses two main research questions. First, what are the residents' opinions towards impacts of CHT in the Kullu valley and Second, do the opinions of residents vary among respondents, given their variables of gender, employment in the tourism sector, age and education qualification.

Literature Review

Local resident's opinions and attitudes

Attitude expresses feelings about something, whether they are favourable, unfavourable, or neutral. (Vidal Rua, 2020; Solomon, Stone, 2002). Locals' views about tourism are revealed by their opinions, which might be neutral, negative, or positive. Since local's involvement is essential to the success and sustainability of any tourism destination, it is imperative that local government, policymakers, and businesses comprehend people's viewpoints and get the required support (García et al., 2015). Additionally, local opinions affect tourists' satisfaction and loyalty. A destination's ability to comprehend resident's opinions towards tourism development is essential to its success (Sangpikul, 2018; Fytopoulou et al., 2021). Many studies in the past have made efforts to find out the resident's opinions and attitude towards tourism development (Ryan et al., 1998; Snaith, Haley,1999; Mason, Cheyne, 2000; Cavus, Tanrisevdi, 2003; Schofield, 2011; Gursoy et al., 2019). Research evaluating how local residents perceive tourism tends to focus on opinions about the socio-cultural and economic impacts of its influence, both positive and negative. However, many studies show that, regardless of the dimensions, the social-psychological effects of tourism are disregarded. (Gursoy et al., 2019). However, a number of studies have shown that tourism has benefits and drawbacks, notably conflicts between the locals and the government (Beaumont, Dredge, 2010). Getz (1994) points out that maximum residents are having a positive opinion about tourism. But there is a change in opinion when destinations reach the growth stage in the destination life cycle. Brida et al. (2011) examines how locals see the impacts of tourism in Flogaria, Italy and points out that local populations have a positive opinion towards the economic and socio-cultural impacts of tourism in their area. Brida et al. (2014) explores the resident's perception of tourism impacts and resident's attitude towards tourism policies and proposed residents are more inclined to support tourism policies if they see positive effects of tourism on the environment and see positive socio-cultural, economic and environment impacts. Canizares et al. (2014) analyses the perceptions and attitudes of residents in Cape Verde, Africa and reveals that the local community perceives that tourism creates opportunities for economic growth especially for the local communities whose culture is in transition. Gracia et al. (2014) points out that many studies have revealed that local residents have a positive opinion on the various socio-cultural impacts and economic impacts of tourism. On the other hand, local residents are also concerned and worried about the darker side and negative impacts of tourism. Gracia et al. (2017) examines the resident's attitude in several micro destinations and points out that there is a gap in the resident's opinions among different micro tourism destinations due to significant community adjustment to tourism impacts. Gray (1970) also highlights the perceived economic benefits namely community benefit, business benefit and personal benefit are the main reasons for locals to support tourism.

Tourism impacts

Local resident's opinions and perception about tourism development is very significant for sustainable tourism growth of a destination (Zhu et al., 2017; Rasoolimanesh, Jaafar, 2017; Timur, Getz, 2009; Almeida-García, 2016). Therefore, it is very important to study and understand the attitude of local residents towards the impacts of tourism (Kuvan, Akan, 2005; Lundberg, 2017). Stynes (1997) mentions communities are concerned primarily on the support of tourism to the

native economy. Lui and Var (1986) clearly mentions that local communities strongly agree that tourism provides both cultural and economic benefits. Many studies have clearly stated that tourism is creating both positive and negative impacts at various destinations across the globe (Higham, 1999; King et al., 1993; Crouch, Ritchie, 1999; Guttentag, 2009; Mathew, Sreejesh, 2017). Every destination offers a different form of tourism across the globe (Buhalis, 2000; Jovicic, 2019). Cultural heritage tourism is one of the prominent forms of tourism in which different communities are involved (McKercher, Du Cros, 2002; Timothy, Boyd, 2006; Timothy, 2011). Cultural heritage tourism has both positive as well as negative impacts on local community and economy (Bowitz, Ibenholt, 2009; Girard; Nijkamp, 2009; Chen, Chen, 2010) therefore, it is very essential to know the local resident's opinion and attitude about tourism activities (Williams, Lawson, 2001; Sharma, Dyer, 2009, Andereck, Nyaupane, 2011; Lundberg, 2017). The most compelling reason for residents to participate in and support tourism development in their community has been identified as the immediate personal benefits that come from tourism (Nunkoo, Ramkissoon, 2011). Previous research has objectively shown a positive correlation between the benefits an individual receives from tourism exchange and more positive opinions about the impacts of tourism (Wang, Chen, 2015). Destination planners and policy makers have recognised the need to understand the opinions of local residents to ensure sustainable tourism development at the destination (Brokaj, 2014).

Methodology

Quantitative technique was used for the present study. The primary data was collected with the help of questionnaires in different villages of Kullu valley spread over various Kothis and Fhattis. In the initial stage a pilot survey was conducted on 30 local residents in ten different villages. The final questionnaire was modified on the basis of suggestions and comments collected during the pilot survey.

The first section of the questionnaire consisted of the demographic profile with questions like name, age, marital status, education qualification, gender, income and employment of the residents. The questions were taken from previous studies by Snaith and Haley (1999), Williams and Lawson (2001), Mason and Cheyne (2000), Cavus and Tanrisevdi (2003), Timur and Getz (2009), Schofield (2011), García et al. (2015), Zhu et al. (2017), Balaji (2019) and Gomez (2019) and modified as per the need of the study.

In the second section of the questionnaire, respondents were asked their opinions towards cultural heritage tourism and its positive and negative impacts on local community, culture, and economy. The items in the questionnaire were taken from previous studies by Timothy and Boyd (2006), Balaji (2019) and Gomez (2019), Brida et al. (2011), Andereck and Nyaupane (2011) and modified as per the requirement of the study.

A five point Likert scale was used from strongly agree (5) to strongly disagree (1) to measure various items in each construct. Data collection was carried out at the end of the tourist season in the months of August to October, 2023 so that the respondents have enough time to spare and fill their responses. Around 230 questionnaires were self-administered and distributed in fifty villages across Kullu valley. Finally, the filled questionnaires were scrutinized, out of which 200 usable samples were taken from local residents of fifty villages of Kullu valley.

SPSS software version 27 was used to analyse the collected data. Firstly, descriptive statistics were employed to find out the frequency and percentage distribution of the respondents demographic profiles and Secondly, to find out if there is any significant difference of opinion

towards socio-cultural and economic impact of cultural heritage tourism independent t-test and One-way ANNOVA (analysis of variance) were applied.

Results

Table 1. displays most of the residents who participated in the study from Kullu valley were males 121 (60.5%) and 79 (39.5%) were females, the largest age category was 25 to 40 years, 90 (45%), followed by the other age groups under 25 years, 75 (37.5%), 40 to 60 years, 32 (16%) and 60+ years, 3 (1.5%). 71 (35.5%) were married and 129 (64.5%) were unmarried. 156 (78%) were born in Kullu valley and 44 (22%) were born outside Kullu valley. 107 (58.5%) held a higher degree of post-graduation and above followed by 63 (31.5%) holding an undergraduate degree and 20 (10%) possessed school education. Most of the respondents were working in the tourism sector 146 (73%) and the rest 54 (27%) were working in other sectors. More than half of the respondents 102 (51%) had a monthly income "0 to 25000" followed by 58 (29%) with an income of 25000 to 50000, 28 (14%) with an income of 50000 to 100000 and 12 (6%) with an income of 100000 above.

Table 1. *Residents demographic profile*

	Demographics	Frequency	Percentage
Gender	Male	121	60.5
	Female	79	39.5
Age	Under 25 years	75	37.5
	25 to 40 years	90	45
	40 to 60 years	32	16
	60+ years	3	1.5
Marital Status	Married	71	35.5
	Unmarried	129	64.5
Place of Birth	Kullu Valley	156	78
	Himachal Pradesh	44	22
Education qualification	Post-Graduation and above	31	15.5
	Post-Graduation	86	43
	Under Graduation	63	31.5
	School Education	20	10
Are you employed in tourism sector	Yes	146	73
	No	54	27
Income in Indian Rupees per month	0 to 25000	102	51
	25000 to 50000	58	29
	50000 to 100000	28	14
	100000 above	12	6

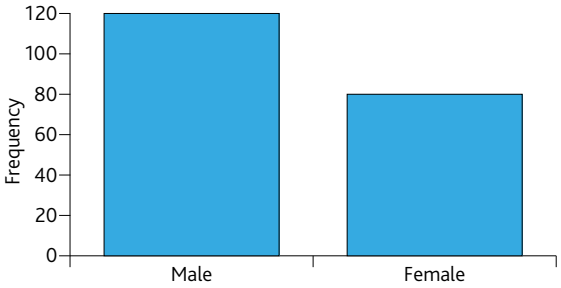

Figure 1. Respondents gender

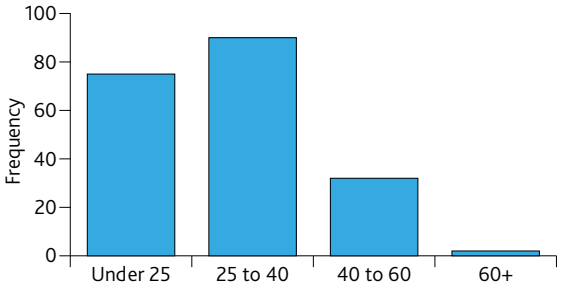

Figure 2. Respondents age

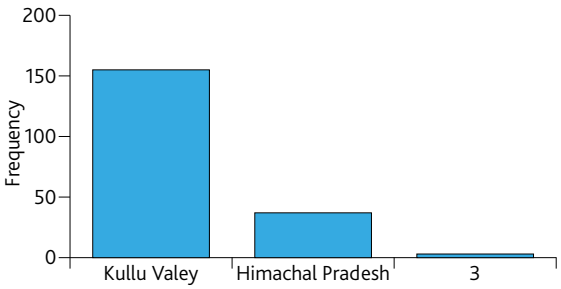

Figure 3. Respondents place of birth

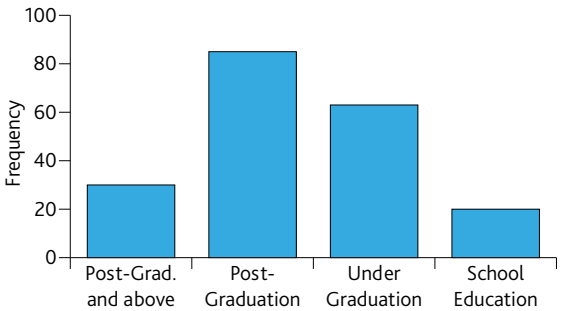

Figure 4. Respondents education qualification

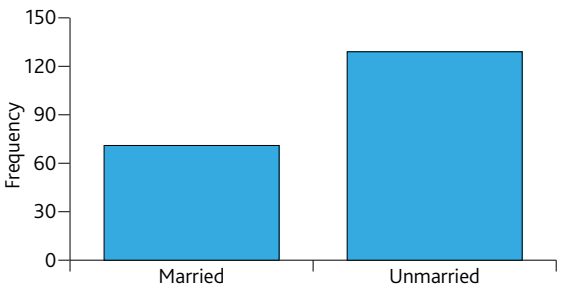

Figure 5. Respondents marital status

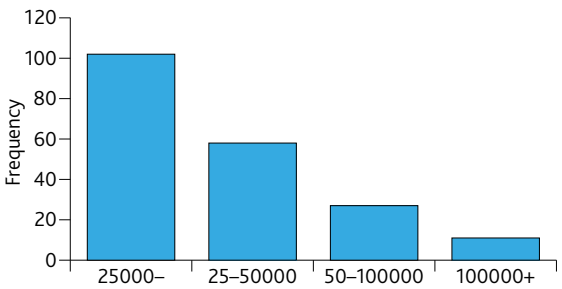

Figure 6. Respondents income in Indian rupees/month

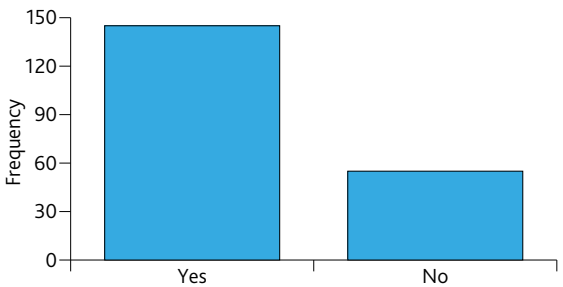

Figure 7. Respondents employment status

Table 2 displays there are no significant differences in all ten items associated with socio-cultural impacts and gender of the residents. Both males and females agree that cultural heritage tourism offers opportunities for locals to learn about new cultures and share their culture with tourists and feel proud about it. Culture Heritage tourism also empowers women, improves the standard of living and helps in the welfare of the locals. On the other hand, both males and females also agree that cultural heritage tourism also has negative impacts which creates difference of opinions amongst the locals, motivates locals to adopt outside culture, affects local traditions and leads to convergence of culture.

Table 2. *Independent T-test on socio-cultural impacts and Gender*

Statements	Male (n=121)	Female (n=79)	t value	P value
Cultural Heritage tourism offers opportunities to learn about new cultures.	4.57	4.57	.007	.995
Cultural Heritage tourism helps in women empowerment.	4.40	4.37	.268	.789
Cultural Heritage tourism allows locals to understand the value of their culture and feel proud about it.	4.61	4.53	.809	.420
Cultural Heritage tourism improves the local standard of living.	4.31	4.23	.705	.482
Cultural Heritage tourism helps in reviving the local art.	4.26	4.30	-.438	.662
Cultural Heritage tourism helps in the welfare of the locals.	4.22	4.27	-.395	.693
Cultural Heritage tourism creates a difference of opinions amongst the locals.	3.98	3.94	.271	.787
Cultural Heritage tourism leads to convergence of culture.	4.06	4.01	.338	.736
Cultural Heritage tourism has a negative impact on local traditions like Dev Parampra, marriage rituals etc.	3.84	3.54	1.731	.085
Locals are adopting new cultures because of cultural heritage tourism.	4.25	3.97	1.906	.058

Table 3 displays there are no significant differences in all the ten items associated with economic impacts and gender of the residents. Both males and females agree that cultural heritage tourism creates employment and business opportunities for locals, offers good prices on farmer's yield, generates income for temples and eradicates poverty. On the other hand, both males and females also agree that cultural heritage tourism also brings negative effects such as it encourages commodification of local culture, increases taxes, price of daily goods, cost of living and leads to overpricing.

Table 3. *Independent T-test on economic impacts and Gender*

Statements	Male (n=121)	Female (n=79)	t value	P value
Cultural Heritage tourism creates employment.	4.55	4.43	1.134	.258
Cultural Heritage tourism provides business opportunities for locals.	4.46	4.48	-.196	.845
Cultural Heritage tourism helps in eradicating poverty.	4.27	4.14	1.062	.289
Cultural Heritage tourism helps farmers to get good prices on yield.	3.99	3.97	.114	.909
Cultural Heritage tourism leads to commodification of local culture.	4.00	3.90	.705	.482
Cultural Heritage tourism increases the income of temples.	3.69	3.62	.358	.721
Cultural Heritage tourism increases the prices of daily use products.	3.98	4.13	-.976	.330
Cultural Heritage tourism leads to overpricing at tourist places.	4.22	4.41	-1.342	.181
Cultural Heritage tourism increases taxes.	3.97	4.00	-.236	.814
Cultural Heritage tourism increases the cost of living.	4.12	4.11	.075	.941

Table 4 displays there are no significant differences in all ten items associated with socio-cultural impacts and employment of the residents. Both residents who are working in the tourism industry and residents who are not associated with the tourism industry agree that cultural heritage tourism offers opportunities for locals to learn about new cultures and share their culture with tourists and feel proud about it. Culture Heritage tourism also empowers women, improves the resident's standard of living and helps in the welfare of the locals. On the other hand, both groups agree that cultural heritage tourism also creates negative effects such as difference of opinions amongst the locals, motivates locals to adopt outside culture, affects local traditions and leads to convergence of culture.

Table 4. *Independent T-test on socio-cultural impacts and employment*

Statements	Yes (n=146)	No (n=54)	t value	P value
Cultural Heritage tourism offers opportunities to learn about new cultures.	4.60	4.48	1.194	.234
Cultural Heritage tourism helps in women empowerment.	4.38	4.39	-.044	.965
Cultural Heritage tourism allows locals to understand the value of their culture and feel proud about it.	4.64	4.43	1.955	.052
Cultural Heritage tourism improves the local standard of living.	4.25	4.35	-.866	.388
Cultural Heritage tourism helps in reviving the local art.	4.28	4.26	.180	.857
Cultural Heritage tourism helps in the welfare of the locals.	4.21	4.33	-1.078	.282
Cultural Heritage tourism creates a difference of opinions amongst the locals.	3.92	4.06	-.837	.404
Cultural Heritage tourism leads to convergence of culture.	4. 03	4.06	-.145	.855
Cultural Heritage tourism has a negative impact on local traditions like Dev Parampra, marriage rituals etc.	3.64	3.96	-1.716	.088
Locals are adopting new cultures because of cultural heritage tourism.	4.13	4.17	-.229	.819

Table 5 displays there are no significant differences in all the ten items associated with economic impacts and employment of the residents. Both residents who are employed in the tourism industry and residents who are not associated with the tourism industry agree that cultural heritage tourism creates employment and business opportunities for locals, offer good prices on farmer's yield, generate income for temples and eradicate poverty. On the other hand, both groups also agree that cultural heritage tourism also encourages commodification of local culture, increases taxes, price of daily goods, cost of living and leads to overpricing at the destination.

Table 5. *Independent T-test on economic impacts and employment*

Statements	Yes (n=146)	No (n=54)	t value	P value
Cultural Heritage tourism creates employment.	4.53	4.43	.907	.365
Cultural Heritage tourism provides business opportunities for locals.	4.46	4.50	-.402	.688
Cultural Heritage tourism helps in eradicating poverty.	4.18	4.33	-1.122	.263
Cultural Heritage tourism helps farmers to get good prices on yield.	3.91	4.19	-1.680	.095
Cultural Heritage tourism leads to commodification of local culture.	3.95	3.98	-.186	.853
Cultural Heritage tourism increases the income of temples.	3.59	3.85	-1.306	.193
Cultural Heritage tourism increases the prices of daily use products.	4.00	4.13	-.758	.449
Cultural Heritage tourism leads to overpricing at tourist places.	4. 28	4.33	-.350	.727
Cultural Heritage tourism increases taxes.	3.92	4.15	-1.501	.135
Cultural Heritage tourism increases the cost of living.	4.08	4.24	-1.121	.264

Table 6 displays there are no significant differences found amongst all four age groups, namely under 25 years, 25 to 40 years, 40 to 60 years and 60+ years in ten items associated with socio-cultural impacts of cultural heritage tourism.

Table 6. *One way ANNOVA on socio-cultural impacts and age*

Statements	Under 25 (N=75)	25 to 40 (N=90)	40 to 60 (N=32)	60+ (N=3)	f value	P value
Cultural Heritage tourism offers opportunities to learn about new cultures.	4.48	4.46	4.50	5.00	1.635	.183
Cultural Heritage tourism helps in women empowerment.	4.35	4.43	4.38	4.40	.438	.726
Cultural Heritage tourism allows locals to understand the value of their culture and feel proud about it.	4.43	4.69	4.63	4.67	2.213	.099
Cultural Heritage tourism improves the local standard of living.	4.17	4.27	4.56	4.00	2.217	.098
Cultural Heritage tourism helps in reviving the local art.	4.28	4.32	4.16	4.00	.518	.670
Cultural Heritage tourism helps in the welfare of the locals.	4.16	4.30	4.28	4.00	.616	.606
Cultural Heritage tourism creates a difference of opinions amongst the locals.	3.85	4.02	3.97	4.67	.934	.425
Cultural Heritage tourism leads to convergence of culture.	3.92	4.04	4.25	4.67	1.445	.231
Cultural Heritage tourism has a negative impact on local traditions like Dev Parampra, marriage rituals etc.	3.71	3.77	3.63	4.00	.167	.919
Locals are adopting new cultures because of cultural heritage tourism.	3.99	4.18	4.41	4.00	1.422	.238

Table 7 displays there are significant differences found in two items associated with economic impacts of cultural heritage tourism. Post-hoc test results shows that respondents of 25 to 40 years' age group have significant difference of opinion about "Culture Heritage tourism creates employment" Similarly, the results also show that respondents of 40 to 60 years' age group have significant difference of opinion about "Culture Heritage tourism leads to commodification of local culture" when compared with other age groups.

Table 7. *One way ANNOVA on economic impacts and age*

Statements	Under 25 (N=75)	25 to 40 (N=90)	40 to 60 (N=32)	60+ (N=3)	f value	P value
Cultural Heritage tourism creates employment.	4.27	4.63	4.72	4.00	5.779	.001*
Cultural Heritage tourism provides business opportunities for locals.	4.43	4.51	4.44	4.67	.355	.785
Cultural Heritage tourism helps in eradicating poverty.	4.27	4.14	4.28	4.67	.612	.608
Cultural Heritage tourism helps farmers to get good prices on yield.	3.96	4.01	3.91	4.67	.531	.662
Cultural Heritage tourism leads to commodification of local culture.	3.73	3.98	4.44	4.00	3.960	.009*
Cultural Heritage tourism increases the income of temples.	3.63	3.57	3.97	4.00	.886	.450
Cultural Heritage tourism increases the prices of daily use products.	3.93	4.06	4.16	4.67	.716	.543
Cultural Heritage tourism leads to overpricing at tourist places.	4.27	4.29	3.94	4.67	.207	.892
Cultural Heritage tourism increases taxes.	3.84	4.09	3.94	4.67	1.440	.232
Cultural Heritage tourism increases the cost of living.	3.99	4.19	4.25	4.00	.908	.438

Table 8 displays there are significant differences found in one item associated with socio-cultural impacts of cultural heritage tourism. Post-hoc test results show that the respondents in the school education category have a significant difference of opinion about "Culture Heritage tourism improves the local's standard of living" when compared with other education groups.

Table 8. *One way ANNOVA on socio-cultural impacts and educational qualification*

Statements	Post-Graduation and above (N=31)	Post-Graduation (N=86)	Under Graduation (N=63)	School Education (N=20)	f value	P value
Cultural Heritage tourism offers opportunities to learn about new cultures.	4.55	4.66	4.46	4.55	1.250	.293
Cultural Heritage tourism helps in women empowerment.	4.65	4.42	4.27	4.20	2.174	.092
Cultural Heritage tourism allows locals to understand the value of their culture and feel proud about it.	4.77	4.58	4.51	4.50	1.165	.324
Cultural Heritage tourism improves the local standard of living.	4.32	4.31	4.06	4.70	3.966	.009*
Cultural Heritage tourism helps in reviving the local art.	4.39	4.35	4.14	4.20	1.232	.299
Cultural Heritage tourism helps in the welfare of the locals.	4.35	4.26	4.17	4.20	.436	.728
Cultural Heritage tourism creates a difference of opinions amongst the locals.	3.94	3.99	3.84	4.25	.919	.433
Cultural Heritage tourism leads to convergence of culture.	4.03	3.97	4.08	4.25	.568	.636
Cultural Heritage tourism has a negative impact on local traditions like Dev Parampra, marriage rituals etc.	3.74	3.69	3.70	3.95	.275	.844
Locals are adopting new cultures because of cultural heritage tourism.	4.06	4.06	4.24	4.30	.623	.601

Table 9 displays there are significant differences found in one item associated with economic impacts of cultural heritage tourism. Post-hoc test results show that the respondents in Post-Graduation and above category have significant differences of opinion about "Culture Heritage tourism helps farmers to get good prices on yield" when compared with other education groups.

Table 9. *One way ANNOVA on economic impacts and educational qualification*

Statements	Post-Graduation and above (N=31)	Post-Graduation (N=86)	Under Graduation (N=63)	School Education (N=20)	f value	P value
Cultural Heritage tourism creates employment.	4.58	4.52	4.38	4.65	1.078	.359
Cultural Heritage tourism provides business opportunities for locals.	4.65	4.50	4.37	4.40	1.486	.220
Cultural Heritage tourism helps in eradicating poverty.	4.29	4.23	4.14	4.30	.292	.931
Cultural Heritage tourism helps farmers to get good prices on yield.	4.32	4.07	3.73	3.90	2.705	.047*
Cultural Heritage tourism leads to commodification of local culture.	3.87	3.90	3.97	4.35	1.242	.296
Cultural Heritage tourism increases the income of temples.	3.52	3.49	3.81	4.15	1.981	.118
Cultural Heritage tourism increases the prices of daily use products.	3.97	4.01	3.98	4.40	.873	.456
Cultural Heritage tourism leads to overpricing at tourist places.	4.13	4.28	4.33	4.50	.680	.565
Cultural Heritage tourism increases taxes.	3.97	4.05	3.86	4.10	.576	.632
Cultural Heritage tourism increases the cost of living.	4.10	4.03	4.17	4.35	.728	.536

Discussion and Conclusion

Findings of the present study point out strong opinions of the residents to present tourism development in Kullu valley which is connected with the role of cultural heritage tourism in economic growth and improvement of living standards of local residents. Kullu valley has grown as a popular cultural heritage tourism destination in India over the past couple of years. Local communities favour tourism because tourism has promoted Kullu valley as a famous tourism destination and has also improved its public infrastructure. On the other hand, residents also believe that state tourism authorities have failed in promotion, planning and managing tourism development in Kullu valley.

The opinions of residents about socio-cultural impact of cultural heritage tourism are somewhat ambiguous. Residents agree that cultural heritage tourism provides opportunities for locals to learn new cultures and exchange theirs with the tourists (McKercher, Du Cros, 2002; Timothy, 2014; Loulanski, Loulanski, 2011). Cultural heritage tourism has also helped locals to understand the value of their culture and feel proud about it (Besculides et al., 2002; Kim, Lee, 2020). The findings also confirm that cultural heritage tourism also have helped in reviving the local art forms, empowering the local women and led to better standard of living (Timothy, Ron, 2013). On the other hand, residents also believe that cultural heritage tourism also leads to difference of opinions amongst the locals, spreads convergence of local culture, escalation of negative effects on local traditions and increases chances of adopting outside culture.

However, opinions of residents about the economic impact of cultural heritage tourism are also very strong. Residents agree that cultural heritage tourism creates opportunities for jobs

and local businesses, eradicates poverty and helps farmers to get good prices on yield. Similar opinions of residents on economic impacts are also supported by other studies (Ashley et al., 2007; Bowitz, Ibenholt, 2009). On the other hand, residents also believe that cultural heritage tourism also leads to overpricing at tourist places, increases the prices of daily goods, drives commodification of local culture and increases taxes and cost of living. Which is similar to the results of the study by (Baranowski, Furlough, 2001; Buhalis, 2000).

Increasing tourism growth in Kullu valley over the years have resulted in strong opinions of residents towards the positive and negative impact of cultural heritage tourism. The findings of the study also display that demographic variables like age and education have a significant role in explaining the opinions of residents about the impacts of cultural heritage tourism in Kullu valley. On the other hand, gender and employment of the respondent doesn't show any significant role in the opinions of residents.

It is clear from the findings of the study that local residents support cultural heritage tourism activities and tend to welcome its socio-cultural and economic impacts. Equally they are also conscious about the negative impacts of cultural heritage tourism particularly on the local community, culture and economy.

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TURIZAM
Volume 28, Issue 3
154–176 (2024)
ORIGINAL
SCIENTIFIC PAPER

Assessing Big Data Analytics and Characteristics in Tourism: Agodi Gardens, Ibadan, Nigeria

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Received: October 2023 | Accepted: October 2024
DOI: 10.5937/turizam28-47088

Abstract

There is a plethora of both organized and haphazard data in tourism destinations. Analyzing this data appropriately is crucial for optimal engagement. This study focuses on the connection between big data analytics and big data's characteristics in Agodi Gardens, Ibadan, Nigeria. Specific objectives were to examine the characteristics of big data; as well as to examine Descriptive and predictive data analytics. Respondents were chosen purposively. Survey instrument (questionnaire) was used to elicit data. Data was collected using structured questionnaire. The collected data were analyzed descriptively and inferentially. The study revealed that significant relationship exists between the prescriptive/descriptive big data analytics and the characteristics of big data. Precisely, there is a significant relationship between prescriptive data analytics and velocity, veracity, volume as well as value. Similarly, there is a significant relationship between descriptive data analytics and volume, variety, value as well as veracity. Likewise, variety and veracity of big data could influence big data analytics. The study therefore recommends that the management of Agodi Gardens should engage thorough big data analytics, so that data elicited by customers can be appropriately analysed and topical inference could be drawn from the analysis.

Keywords: *Big Data Analytics, Big Data Characteristics, Prescriptive Analytics, Agodi Gardens*

Introduction

Tourism is an industry that earns countries around the world significant and reliable income. Many countries are increasingly exploring various tourism potentials within their spatial boundaries for revenue generation. Tourism is very important to various nations and states, based on the fact that it could generate impressive revenue (Olawuyi 2022; Olawuyi, Alabi, 2018). Tourism essentially deals with travel to destinations for leisure purpose. It is basically a social discipline with effect on the economy and/or the environment where the tourism destination is situated. This effect can either be positive or negative.

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Data is majorly information that could be collected, processed and analyzed. The proportion of data in a particular area usually dictates how they can be manipulated, utilized and stored. It is notable that data can be in various sizes. A significant volume of data can be referred to as big data. A significant supply of data and big means for processing such data created the phenomenon "Big Data" (Yallop, Seraphin, 2020). In essence, data in a large scale or volume is referred to as big data. Leung and Lo (2019) noted that the definition of big data is inclusive of consolidated data from different origin, for instance, data in operational registers and also social media posts. The concept 'Big Data' can be described as a category of impressive data volume that can be explored in generating useful insights to facilitate decisions of management (Leung, Lo, 2019). The concept of big data is a major theme in several discourses and texts, because, of the fact that it can be found anywhere, at any time. Big data's development has turned to become a trending topic in recent time (Zhu, 2016).

There is a conceptual and empirical literature gap that exists vis-à-vis big data characteristics and data analytics in tourism destinations in Nigeria. Li et al. (2018) noted that the concept of big data for tourism is very much in the preliminary phase, irrespective of tourism being a sector generating big data that could be competitively advantageous. Similarly, Mariani (2019) noted that the tourism sector is operationalizing big data progressively, meanwhile, there is much to be done in terms of improvement of big data's usage and interpretations precisely its analytics. Thus, in terms of the characteristics and the analytics of big data for tourism destinations, there is room for a lot of probing and enunciation of solutions. This study thus aimed at examining the synergy between each of the components of big data characteristics and big data analytics in tourism destination in Nigeria, using Agodi gardens as the study area. Specific objectives engaged for this study were to examine the characteristics of big data; as well as to examine descriptive and predictive data analytics. Respondents were chosen purposively. Survey instrument (questionnaire) was used to elicit data.

Literature review

Big data in organizations

It is no gainsaying that there are different forms and proportions of processed and unprocessed data in a typical organization. The daily activities or engagements of people in a typical organization churn out data of different sizes. Each section of an organization has its peculiar data. Oftentimes, data generation by each section are in of big volume and proportion. Organizational sections that can generate big data are inclusive of legal, sales, marketing, purchasing, financial and human resource (Krishnan, 2013). Other sections of business entities such as security, logistics corporate social departments and so on, also churn out Big Data. There is a gamut of data trapped in the daily business transactions and activities of organizations. Customer inquiry in itself traps substantive data, talk less of the main business transactions that involves exchange of cash, invoices, bank drafts and other germane documents that must be captured in the register of the organization. Big data format is inclusive of an array of data like document, electronic mail, SMS, image, graph, video, outcomes of different electronic created telephone data, signal from GPS, sensor, machine's entries and technologies for analysing DNA (Li et al., 2015).

Thus, many organizations explore these technologies for transactional, relational and other important purposes. These technologies are capable of making life easier for the customers,

the staff members of the organization and the management of the organization. Information about organization that prospective customers and customers would have walked in to the organizations to seek can be easily sought via the technologies established by the organization. In the same vein, organization can set up a feedback mechanism through technologies, so as to be able to be fed in about the perception of the customers towards the services rendered by the organization. For several years, business entities have gathered and analyzed data on the digital space one way or the other in a bid to improve their performances (Camilleri, 2019). Many organizations with internet presence are really mining digital data to make organizational decisions as a result of inferences that must have been drawn from the mined data.

Big data and technology

It is notable that data is a concept that has been around for a long time, but the concept of big data emanated as a result of the preponderance of data that are available in a location or different locations at the same or different time(s). The fact that human's population have increased and there are technological facilities to help reduce friction of distance in real time, implies, that big data will be generated in different quarters and sections in real time. Technology has indeed enhanced the multiplication and spread of data from one spatial destination to another spatial destination irrespective of distance. With the increasing volume of data and the creation of unstructured data, information that must be subjected to processing has significantly gone beyond the capacity of traditionally inclined database devices and software in collecting, storing, managing and analyzing and different technological inventions to process big volume of date must be used (Zhang et al., 2021). Only technologies with large repositories can manage, process, store and distribute big data. This is as a result of the fact that the technologies are developed with commensurate data capacities, thus, since, big data essentially involves large volume of data, then, it is expected that technologies with large data capacities can only handle and manage big data.

There have always been technologies used to retrieve and manage data. Although, the technologies could either be termed obsolete or contemporary. Recent technologies have impressively made it is relatively easier to manage big data. Recent technologies are furnished with big data repositories to be able to meet up with the demand of the big data found in contemporary times. Otherwise, most of the data will be haphazard and largely unstructured. Aside, enhanced storage capacities of the technologies, they also have enhanced speed in collecting and processing big data. The increasing technological advancement has led to substantive enhancement of the speed for processing and saving of enormous data volumes (Camilleri, 2019). These data can either be present in the structured form or unstructured form. Data can also be in the digital form or otherwise. There are unstructured digital data too. The internet, social media, various applications are replete with a gamut of big data. These technologies have made life easier, in terms of access to information in real time. Thus, there is increased number of people that register on and explore these technological innovations and developments for different purposes. Just logging on these technologies is capable of producing big data because, the traffic alone can be subjected to measurability. Thus, technologies are capable of generating both structured and unstructured data from organizations and prospective tourists of tourism destinations. Mariani et al. (2018) opined that the circumlocution identifies the enormous volume of both unstructured and structured data generated by technology developments and the exponentially increasing adoption of devices allowing for automation and connection to the Internet. The more the technology adopted the more the data that can

be harvested and structured. Similarly, premised on the fact that technologies are also capable of generating data, then, the more the technologies adopted the more the data that can be generated in the organization. The source of big data varies, usually, it contains digitally based footprints of users' mobile phones, their credit cards and their social media (WTO, 2020).

Big data in tourism destination

Tourism is part of the fields that generates big data (Chen et al., 2021). This is premised on the fact that it is a field that essentially involves displacement of people from one location to another location for leisure. A major activity in the tourism is travel. Definitely, while travelling, a lot of data can be elicited or retrieved by the tourist. On a similar note, when tourists arrive at the host destination, there are various exchanges and interactions that could generate big data. Major part of big data generated in tourism are made up of electronic vertices of the travel plans of tourist and the behavioral disposition that they exhibit while in transit and the trend is favorable to usage of multiple channels (Xiang et al., 2015). It is notable that in the case of arm chair tourism, big data could also be generated.

Tourism destinations are essentially organizations capable of meeting the leisure and educational desires of tourists. Tourism destinations usually play host to a large number of people (tourists) either at specific time of the year, every other day or every day, depending on the type of tourism facilities in place. The steady inflow of people to tourism destinations equates that there will be enormous data in and around such destinations. A lot of tourism destinations have employed technological innovation and development for specific aspect of their transactions and services rendered to customers. For instance, prospective tourists may check out the facilities available in a tourism destination before setting out to visit such destination. Mobiles phones have made it easy for prospective tourists to review and examine facilities of tourism destinations. Chen et al., (2021) opined that the influence of mobile phones and internet is not only restricted to revolutionizing the means for decision making by tourist, with precise substantive implication for tourism, but has further culminated into the creation of contemporary forms of data useful in addressing and providing insights into obsolete and recent questions. Prospective tourists' access to information of tourism destination can significantly affect the eventual decision that will be made by the tourist. Thus, it is of utmost importance that the tourism destination furnishes their webpage and social media handles with contents that could better sell the destination to the prospective tourist. Conversely, tourism destination can also monitor the activities of the users of their social media handles and webpages, in a bid to collect big data of such user vis-à-vis their likes, preferences, reservations and so on. Progressive advances of internet technologies and the adoptive usage of mobile gadgets have led to the creation of enormous user-generated big data, where populous buzzwords have created changes in the field of tourism and hospitality (Mariani et al., 2018).

The source of big data in organizations, especially, tourism-based organization is numerous depending on how vast the business trajectory of the organization. Big data is premised on heterogeneity of different sources of data, with the support of enhanced stored information, analytics, and technological processes with big data thinking privileges (Zhang et al., 2021). The big data generated in tourism destinations can either be user-generated, tourism-destination generated or environment-generated. The forms of data that are really useful for tourism can be generally be categorized as those created by operators of tourism and online travel, that have developed with movements in the distribution of travel products,

likewise social media and precise non-tourism big data, inclusive of the those created by mobile technology or smart sensors that cover data, for instance, mobile or credit card capable of providing information on spending trajectories and sequences (ADB and UNWTO, 2021). When big data generated are collected and well processed, they are capable of positively impacting the tourism destination. Usage of data can be considered as innovative disruption in the tourism and hospitality business; meanwhile, it gives room for business entities in these industries to create personalization, offering of convenience, cost saving and general competitive advantages (Evans, 2020).

The characteristics of big data

The defining concepts of big is usually dependent on the description of one or more Vs' that are affiliated to big data. For instance, Krishnan (2013) opined that big data as data volume which is available in various categories of complexities, whose creation is as a result of different velocities that has different categories of ambiguity, that cannot be subjected to processing through old facility, mode of processing, algorithm, or other commercial based off-shelf solutions. Big data is generally characteristically defined by 5 concepts that starts with the letter V and they are, volume, velocity, variety, veracity and value. Each of these concepts has precise trajectory that describe the phenomenon big data. They are described as follows;

1. Volume: This essentially has to do with the size or volume of data. Géczy (2014) opined that the volume of data simply implies its proportion in connection to standard information measurement (bits and bytes). An article by Asian Development Bank (ADB) and World Tourism Organization (UNWTO) (2021) noted that this is the quantity of data that are created and saved for business organization to manage or use; it has enormously increase, precisely after the start of the COVID-19 pandemic. Sonka (2016) noted that big data can be referred to as dataset with size that is beyond the capturing, storage, management and analytic capacity of typical software facilities. Thus, it is a type of data that can only be operationalized by specific big software applications or technologies.
2. Data Velocity: Data velocity refers to the speed or momentum through which data moves. The steady movement of an object is the motion of such object at steady speed and direction Krishnan (2013). This impressive speed of data is as a result of technological innovation and development. Mediratta (2015) noted that the generation of data has been morphed from the old applications such as invoice generation or production where data is being formed during hours of production and majorly limited to the total number of receipts per day or total number of daily productions. With technologies impressive numbers of invoices can be generated within some minutes or hours. In regards to technologies, contemporary technologies have better speed in churning out big data faster than older technologies. Therefore, there is a pressing need for an engine that has ingesting and processing capacities to be able to perform at extreme scalable velocities on extreme volatile volume of data within a short relative period (Krishnan, 2013).
3. Data Variety: One of the essential characteristics of data is its heterogeneity. It could appear in various forms, types and categories. Mediratta (2015) opined that datasets come with a lot new variations and it is notable that social media is one of the pertinent new variations. Processes attached to the complexity affiliated to different forms is based on available pertinent metadata for the identification of what is contained in the real data (Krishnan, 2013).

4. Veracity: This is connected with the capacity of the data to achieve set purpose. It defines the originality of the data in terms of goal achievement. Verification of the data's suitability for its aim and its usability within set analytical model. The veracity of big data is connected to the bias, noises and abnormalities in data: thus, can the stored and mined data contribute meaningfully to the problem that is being analyzed? (Cunha et al., 2020; Song, Liu, 2017)
5. Value: This basically depicts the worth of the data in creating transformative changes and developments. Big data has big value capable of causing technological and scientific breakthroughs, with the capacity of bringing big social change (Zhaohao et al., 2018). The value associated with tourism big data could be explained through its new/rare application in the tourism industry, which, firstly involves individualized application of tourism's big data (Cunha et al., 2020).

Big data analytics

This involves operationalization of big data with appropriate tools or facilities, in a bid to be able to sort, store and disseminate big data in real time. Big Analytics' definition involves collection, organization and analysis of big data in a bid to discovering and visualizing pattern, knowledge and intelligence with sundry information in the big data to support decision making (Sun et al., 2015). Analytics systematically explore different characteristics of big data in a bid to provide solution to an imminent problem or challenge. Sonka (2016) opined that, although, volume, velocity, and variety are germane, analytics is important to create fusion through sources of data and for the creation of novel knowledge. Big data analysis has the capacity to process data from the past and data from the present for future predictions. Mediratta (2015) opined that right now analytics have the capacity to analyze real-time data, that could be created not only from structured in-house data repositories but from non-structured data that emanates from social media applications and the behavioral disposition of consumers.

Based on the fact that big data is enormous in terms of volume, the analytical framework that it must be subjected to must show capacity to conveniently handle the volume that of the data. It must have impressive storage and processing capacity to be able to operationalize the data optimally. Big data analytics usually depends on a broad storage capacity and processing ability, that requires manipulable grid which can be subjected to reconfiguration to suit different purposes (Stergiou et al., 2018). There are specific big data analytical tool that could be engaged depending on the aim of subjecting big data to analytics and the period under study. For instance, Stylos et al., (2021) opined that business enterprises engage metadata from cellphones that are equipped with sensor and sundry electronic gadgets, therefore, providing organizational structure, a different trajectory to meet the organizational needs with enhanced intelligence and creation of value for clients. Similarly, there could be engagement of big data scalable techniques, like text 6 analytics, that give room for business enterprises in processing and tracking data (Buhalis, Sinarta, 2019). The fact that there is a preponderance of internet enabled gadget in both households and offices means that there will be big data around the locations where there are internet facilities and gadgets. Thus, the exploration of these facilities and gadgets to seek for information, submission of application of different kinds, following trends, news and fashion and others could be subjected to proper analytics, so as to be able to make necessary decisions applicable to different quarters.

There are basically three approaches to big data analytics. Sonka (2016) opined that there are three categories to analytical efforts and they are 1) Descriptive: this focuses on the documenta-

tion of what has happened, b) Predictive effort: this explored what will happen and 3) Prescriptive: this identifies what could happen (depending on the engagement of optimized algorithm). Descriptive analytics explores data from the past, such as trend analysis from a particular period to another period in the past. Predictive analytics is based on the use of technology to predict. Predictive analytics solution explores big data via advanced machine learning that provides organization with grounded marketing insights and enhanced alternatives for the creation of competitive advantage and enhanced customer offering (Köseoglu et al., 2020).

Methodology

Sample size

Nanjundeswaraswamy (2021) noted that cochran formula is engaged for calculating sample size using relevant precision level, confidence level as well as calculated proportion of the population's attributes. The sample size used for this study is 248 as determined using Cochran formular at 93% confidence level, evident below:

$$n = \frac{z^2 pq}{e^2}$$

$$n = \frac{(1.89)^2 (0.5)(0.5)}{(0.06)^2} = 248$$

z value was gotten from z table.
p is the (estimated) proportion of the population q is 1-p.
e is the desired level of precision.

Sampling Technique

Nanjundeswaraswamy (2021) noted that the procedure engaged to select a sample from a population could be referred to as sampling. Verma et al., (2017) also noted that established definition of sampling is the capability of researchers to choose a part of the population which is essentially a true representation of the said population.

The respondents for this study were chosen purposively. Verma et al., (2017) opined that purposive sampling is a type of non-random sampling which is researcher(s) intentional selection of specific persons that will be include in a research survey.

Data Collection and Analysis

Survey instrument (questionnaire) was used to collect data. It is notable that out of the 248 administered questionnaire 198 were used because 25 of the questionnaires were practically not filled out by the respondents, while others were returned to the researcher either mutilated or wet. This is premised on the fact that the respondents were basically at the destination for leisure and a lot of them were either not ready to participate in the survey or some didn't give due attention to the research instrument. The collected data was analyzed using descriptive statistics (frequency, percentage, mean and standard deviation) and inferential statistics (correlation and path analysis).

Results

Table 1. *Demography*

	Frequency	Percentage
Age		
20-35	96	48.5
36-51	58	29.3
52 and above	44	22.2
Gender		
Male	69	34.8
Female	129	65.2
Educational qualification		
First school leaving certificate	86	43.4
Bachelor's degree	77	38.9
Postgraduate	35	17.7
Total	198	100

Source: Author's Survey

A large percentage (48.5%) of the respondents are between 20-35 years old. This implies that the highest number of demography that visit Agodi gardens are between 20-35 years old. More females (65.2%) responded to the research instruments. All of the respondents are educated as, 43.4% have first school leaving certificates, 38.9% have bachelor's degrees and 17.7% have post-graduate degrees.

Table 2. *Volume*

	Frequency and percentage	Mean and standard deviation
Response time of attendants is impressive		
Strongly agree	110(55.6%)	1.67±0.92
Agree	57(29.8%)	
Disagree	16(8.1%)	
Strongly disagree	15(7.6%)	
Processing time for inquiry on the website is slow		
Strongly agree	13(6.6%)	3.25±0.83
Agree	10(5.1%)	
Disagree	89(44.9%)	
Strongly disagree	86(43.4%)	
Maintenance of facilities is impressive		
Strongly agree	5(2.5%)	3.26±0.72
Agree	17(8.6%)	
Disagree	97(49.0%)	
Strongly disagree	79(39.9%)	
There are no interferences between the different leisure activities in the destination		
Strongly agree	62(31.1%)	1.85±0.74

	Frequency and percentage	Mean and standard deviation
Agree	113(57.1%)	1.85±0.74
Disagree	14(7.1%)	
Strongly disagree	9(4.5%)	
The garden's environment is not well kept		
Strongly agree	22(11.1%)	3.14±0.97
Agree	15(7.6%)	
Disagree	74(37.4%)	
Strongly disagree	87(43.9%)	
Total	198	100

Source: Author's Survey

55.6% strongly agreed and 29.8% agreed that response time of the attendants is impressive, 44.9% disagreed and 43.4% strongly disagreed that processing time for enquiry on the website is slow. 49% disagreed and 39.9% strongly disagreed that maintenance of facilities is impressive. 31.1% agreed and 57.1% agreed that there are no interferences between the different leisure activities in the destination. 37.4% disagreed and 43.9% strongly disagreed that the garden's environment is not well kept. In descending order, the indicators for volume are rated as follows; maintenance of facility is impressive (3.26±0.72), processing time for enquiry on the website is slow (3.25±0.83), the garden is not well kept (3.14±0.97), no interferences between the different leisure activities in the destination (1.85±0.74) and response time of attendant is impressive (1.67±0.92).

Table 3. *Velocity*

	Frequency	Percentage
I don't know anything about the attraction until this time		
Strongly agree	17(8.6%)	3.21±0.97
Agree	26(13.1%)	
Disagree	54(27.3%)	
Strongly disagree	101(51.0%)	
Its only when there is a major event that is being advertised through the media that I hear about Agodi gardens		
Strongly agree	61(30.8%)	1.99±0.89
Agree	96(48.5%)	
Disagree	23(11.6%)	
Strongly disagree	18(9.1%)	
I hardly get information about Agodi gardens through the social media		
Strongly agree	43(21.7%)	1.89±0.58
Agree	138(69.7%)	
Disagree	14(7.1%)	
Strongly disagree	3(1.5%)	
I got to know about agodi gardens via referral		
Strongly agree	62(31.3%)	1.97±0.83
Agree	87(43.9%)	
Disagree	41(20.7%)	

	Frequency	Percentage
Strongly disagree	8(4.0%)	1.97±0.83
Total	198	100

Source: Author's Survey

51% of the respondents strongly disagreed and 27.3% disagreed that they don't know anything about the attraction until this time. this implies that virtually all of the respondents have information about the Gardens before visiting it. 30.8% strongly agreed and 48.5% agreed that it is only when there is a major event that is being advertised through the media that they hear about Agodi gardens. Thus, there is basically no advertisement about the gardens save when an event is billed to be hosted in the gardens. 21.7% strongly agreed and 69.7% agreed that they hardly get information about the gardens through the social media. It is evident that social media is not explored enough for showcasing and advertising the gardens. 31.3% strongly agreed and 43.9% agreed that they knew about Agodi gardens through referral. In descending order, the indicators for velocity are rated as follows; don't know anything about the attraction until this time (3.21±0.97), it is only when there is a major event that is being advertised through the media that they hear about Agodi gardens (1.99±0.89), I got to know about agodi gardens via referral (1.97±0.83) and difficult getting information about Agodi gardens through the social media (1.89±0.58).

Table 4. *Variety*

	Frequency	Percentage
I came here because I have heard of this garden's paintball		
Strongly agree	82(41.4%)	1.84±0.84
Agree	72(36.4%)	
Disagree	38(19.2%)	
Strongly disagree	6(3.0%)	
I am here just to swim		
Strongly agree	9(4.5%)	3.20±0.93
Agree	41(20.7%)	
Disagree	49(24.7%)	
Strongly disagree	99(50%)	
I am here basically for horse ridiing		
Strongly agree	67(33.8%)	2.56±1.23
Agree	12(6.1%)	
Disagree	61(30.8%)	
Strongly disagree	58(29.3%)	
I am only here for the virtual games		
Strongly agree	59(29.8%)	2.38±1.02
Agree	26(13.1%)	
Disagree	92(46.5%)	
Strongly disagree	21(10.6%)	
I am here for the botanical garden		
Strongly agree	51(25.8%)	2.17±0.86
Agree	70(35.4%)	
Disagree	69(34.8%)	

	Frequency	Percentage
Strongly disagree	8(4%)	2.17±0.86
Total	198	100

Source: Author's Survey

41.4% of the respondents strongly agreed and 36.4% agreed that they were at the gardens because of paintball. 24.7% of the respondents disagreed and 50% strongly disagreed that they were only at the gardens to swim. 30.8% disagreed and 29.3% strongly disagreed that they were only at the gardens for horse riding. 29.8% strongly agreed and 46.5% disagreed that they were at the gardens only for virtual games. 35.4% agreed, while, 34.8% disagreed that they were at the gardens only for the botanical garden. The foregoing reveals that most of the respondents were at the gardens for different activities in the garden rather than for just one activity. In descending order, the indicators for variety that is underpinned by the activities engaged by the tourists are ranked as follows; only to swim (3.20±0.93), only for horse riding (2.56±1.23), only for virtual games (2.38±1.02) and at the gardens because of paintballs (1.84±0.84). this depicts that most of the tourists at Agodi gardens will most likely swim at the pool, followed by riding horses at the garden, followed by playing virtual games and then engage in paintball. This implies that there are various data that can be operationalized by the tourists from the prism of big data. Big data format is inclusive of an array of data like document, electronic mail, SMS, image, graph, video, outcomes of different electronic created telephone data, signal from GPS, sensor, machine's entries and technologies for analysing DNA (Li et al., 2015).

Table 5. *Veracity*

	Frequency	Percentage
All the attractions I saw online are available at the destination		
Strongly agree	49(24.7%)	1.98±0.79
Agree	117(59.1%)	
Disagree	18(9.1%)	
Strongly disagree	14(7.1%)	
All I heard from the person that referred me here is absolutely true		
Strongly agree	57(28.8%)	1.83±0.61
Agree	118(59.6%)	
Disagree	23(11.6%)	
Strongly disagree	-	
I enjoyed every bit of the leisure activities that I participated in while on the park		
Strongly agree	95(48.0%)	1.58±0.64
Agree	95(48.0%)	
Disagree	4(2.0%)	
Strongly disagree	4(2.0%)	
The attendants are ethical with their conducts		
Strongly agree	132(66.7%)	1.59±0.93
Agree	25(12.6%)	
Disagree	31(15.7%)	
Strongly disagree	10(5.1%)	
Total	198	100

Source: Author's Survey

24.7% of the respondents strongly agreed and 59.1% agreed that all the attractions they saw online are available at the destination. This depicts that the management of the gardens are truthful about what the information that they uploaded on the gardens social media platforms. 59.6% of the respondents agreed and 28.8% strongly agreed that all they heard from the person that referred them to the gardens is absolutely true. 48% strongly agreed and 48% agreed that they enjoyed every bit of the leisure activities that they participated in while on the park. 66.7% of the respondents strongly agreed and 12.6% agreed that the attendants are ethical with their conducts. In descending order, the indicators for veracity are rated as follows; all the attractions online are available at the destination (1.98±0.79), all they heard from the referrer is absolutely true (1.83±0.61), the attendants are ethical with their conducts (1.59±0.93) and enjoyment of every bit of the leisure activities (1.58±0.64).

Table 6. *Value*

	Frequency	Percentage
There should be more advertisement for this attraction through print media		
Strongly agree	58(29.3%)	1.79±0.59
Agree	125(63.1%)	
Disagree	13(6.6%)	
Strongly disagree	2(1%)	
All social media platforms should be explored to advertise this attraction		
Strongly agree	65(32.8%)	1.85±0.71
Agree	96(48.5%)	
Disagree	37(18.7%)	
Strongly disagree	-	
There should be trackeable feedbacks on these platforms to monitor the responses of both prospective tourists and tourists		
Strongly agree	70(35.4%)	2.05±0.99
Agree	69(34.8%)	
Disagree	38(19.2%)	
Strongly disagree	21(10.6%)	
Periodically promotions should be done to attract more people		
Strongly agree	125(63.1%)	1.73±1.08
Agree	25(12.6%)	
Disagree	24(12.1%)	
Strongly disagree	24(12.1%)	
Total	198	100

Source: Author's Survey

29.3% strongly agreed and 63.1% agreed that there should be more advertisement for this attraction through print media, 32.8% strongly agreed and 48.5% agreed that all social media platforms should be explored to advertise this attraction. 35.4% strongly agreed and 34.8% agreed that there should be trackable feedbacks on these platforms to monitor the responses of both prospective tourists and tourists. 63.1% strongly agreed and 12.6% agreed that periodically, promotions should be done to attract more people. In descending order, the indicators for value are rated as follows; there should be trackable feedbacks on the platforms for mon-

itoring (2.05±0.99), all social media platforms should be explored to advertise these attractions (1.85±0.71), there should be more advertisement for this attraction through print media (1.79±0.59) and periodically, promotions should be done to attract more people (1.73±1.08).

Table 7. *Descriptive and predictive data analytics*

	Frequency	Mean and Standard deviation
Data from social media can be used to determine level of customer patronage		
Strongly agree	65(32.8%)	2.25±1.14
Agree	63(31.8%)	
Disagree	25(12.6%)	
Strongly disagree	45(22.7%)	
Data from social media can be used to identify challenges tourists encounter while in the attraction		
Strongly agree	69(34.8%)	2.41±1.27
Agree	43(21.7%)	
Disagree	21(10.6%)	
Strongly disagree	65(32.8%)	
Data from social media can be used to decipher customer's expectation		
Strongly agree	50(25.3%)	2.60±1.13
Agree	31(15.7%)	
Disagree	65(32.8%)	
Strongly disagree	52(26.3%)	
Data from the park can be used to predict future challenges and solutions		
Strongly agree	91(46.0%)	1.79±0.88
Agree	67(33.8%)	
Disagree	30(15.2%)	
Strongly disagree	10(5.1%)	
Data from the park can be used to predict people's opinion that will enhance customers patronage		
Strongly agree	26(13.1%)	2.14±0.67
Agree	124(62.6%)	
Disagree	42(21.2%)	
Strongly disagree	6(3%)	
Data from the park can be used to predict strategies for enhancing organizational's productivity		
Strongly agree	36(18.2%)	1.97±0.56
Agree	134(67.7%)	
Disagree	26(13.1%)	
Strongly disagree	2(1%)	
Total	198	100

Source: Author's Survey

Data from social media can be used to determine level of customer patronage (32.8% strongly agreed and 31.8%). Social media's data can useful in identifying challenges tourists encounter while in the attraction (34.8% strongly agreed and 21.7% agreed). Data from social media may not be useful in deciphering customer's expectations (32.8% disagreed and 26.3% strongly disagreed). Data from the park can be used in predicting future challenges and solutions (46% strongly agreed and 33.8% agreed). Data from the park can be used in predicting people's

opinion that will enhance customer's patronage (13.1% strongly agreed and 62.6% agreed). Data from the park can be used to predict strategies for enhancing organizational's productivity (18.2% strongly agreed and 67.7% agreed).

Table 8. *Correlation Matrix*

		Volume	Velocity	Variety	Veracity	Value	Descriptive and predictive
Volume	Pearson correlation Sig. (2 Tailed) N	1 198					
Velocity	Pearson correlation Sig. (2 Tailed) N	-.037 .607 198	1 198				
Variety	Pearson correlation Sig. (2 Tailed) N	.312** .000 198	-.316** .000 198	1 198			
Veracity	Pearson correlation Sig. (2 Tailed) N	-.293** .047 198	.288** .000 198	-.356** .000 198	1 198		
Value	Pearson correlation Sig. (2 Tailed) N	.000 .013 198	-.089 .211 198	-.344** .000 198	.232** .001 198	1 198	
Descriptive and predictive	Pearson correlation Sig. (2 Tailed) N	.013 .860 198	.098 .171 198	-.278** .000 198	.318** .000 198	.001 .986 198	1 198

Correlation is significant at 0.05 level (2-tailed); Source: Author's Survey

The correlation matrix table above shows the relationship between the 5v's of big data and the dynamics of data analytics. It shows that variety (r=.278, p<0.05) has significant positive relationship with data analytics and veracity (r=.318, p<0.05) has significant positive relationship with data analytics; meanwhile, velocity (r=.171, p≤0.05), value (986, p≤0.05) and volume (r=.860, p≤0.05) do not have significant relationship with data analytics. This depicts that for this study there are two characteristics (variety and veracity) of big data that could influence big data analytics. This simply implies that descriptive and predictive big data analytics of Agodi gardens can be done effectively from the trajectories of the variety and veracity of big data. In simple terms it also implies that the big data available for analytics may exhibit structured or/and unstructured nature and the data is essentially accurate.

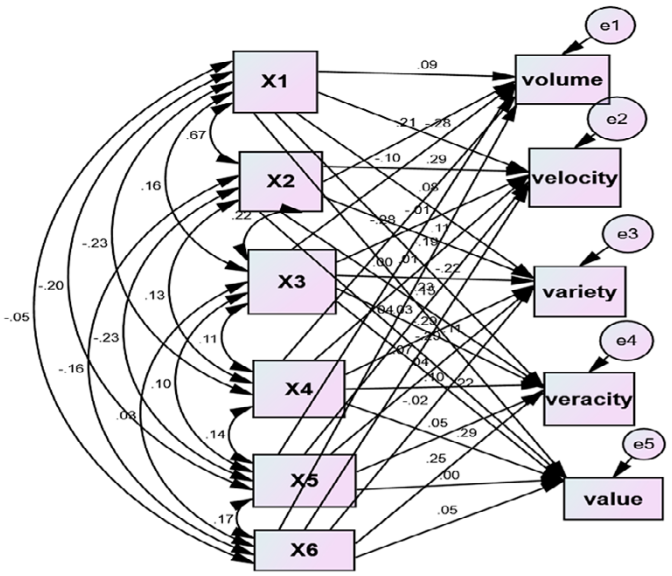

Figure 1. Path Diagram

Table 9. *Goodness-of-Fit Indices*

Model	χ^2	Df	P	GFI	AGFI	NFI	CFI
	93.304	11	.000	0.918	0.507	0.790	0.788

Source: Author's Survey

The chi-square value (χ^2) for the table above is 93.304, P-value is 0.000. The normed-fit index is 0.790, while, the comparative fit index is 0.788 and Goodness of fit index of 0.918. This depicts that the model exhibits goodness of fit.

Table 10. *Regression Weights Table*

			Estimate	S.E.	C.R.	P	Label
Volume	<---	X1	.202	.231	.872	.383	NS
Velocity	<---	X1	-.486	.183	-2.653	.008	S
Variety	<---	X1	.261	.333	.782	.434	NS
Veracity	<---	X1	-.485	.250	-1.942	.052	S
Value	<---	X1	.591	.254	2.324	.020	S
Volume	<---	X2	.434	.211	2.057	.040	S
Velocity	<---	X2	.465	.167	2.784	.005	S

			Estimate	S.E.	C.R.	P	Label
Variety	<---	X2	.347	.304	1.141	.254	NS
Veracity	<---	X2	.343	.228	1.505	.132	NS
Value	<---	X2	-.674	.232	-2.906	.004	S
Volume	<---	X3	-.235	.162	-1.450	.147	NS
Velocity	<---	X3	-.026	.128	-.203	.839	NS
Variety	<---	X3	-.758	.233	-3.248	.001	S
Veracity	<---	X3	.272	.175	1.555	.120	NS
Value	<---	X3	.566	.178	3.178	.001	S
Volume	<---	X4	-.855	.226	-3.786	***	S
Velocity	<---	X4	.015	.179	.083	.934	NS
Variety	<---	X4	-1.279	.326	-3.927	***	S
Veracity	<---	X4	.334	.244	1.370	.171	NS
Value	<---	X4	.963	.249	3.873	***	S
Volume	<---	X5	.008	.281	.028	.977	NS
Velocity	<---	X5	-.105	.223	-.472	.637	NS
Variety	<---	X5	.218	.405	.539	.590	NS
Veracity	<---	X5	.198	.304	.651	.515	NS
Value	<---	X5	-.001	.309	-.004	.997	NS
Volume	<---	X6	-.164	.304	-.540	.589	NS
Velocity	<---	X6	.247	.241	1.027	.305	NS
Variety	<---	X6	-.156	.438	-.355	.722	NS
Veracity	<---	X6	1.200	.328	3.658	***	S
Value	<---	X6	.254	.334	.759	.448	NS

Source: Author's Survey

- X1 is Data from social media can be used to determine level of customer patronage
- X2 is Data from social media can be used to identify challenges tourist encounter while in the attraction
- X3 is Data from social media can be used to decipher customer's expectation

- X4 is Data from the park can be used to predict future challenges and solutions
- X5 is Data from the park can be used to predict people's opinion that will enhance customer patronage
- X6 is Data from the park can be used to predict strategies for enhancing organizational's productivity

From the above, it is evident that velocity, veracity and volume predict the perception that data from social media could determine level of customer patronage. Volume, velocity and value predict the perception that data from social media can be used to identify challenges tourist encounter while in the attraction. Veracity and value predict the perception that data from social media predict the perception that data from social media could decipher customer's expectation. Volume, Variety and value predict the perception that data could be used to predict future challenges and solutions. Only veracity predicts the perception that data from the study area could be used to predict strategies for enhancing organizational productivity.

Discussion

It can not be overstated that the tourism industry generates pantagruelian amount of data. Alaei and Becken (2019) noted that the volume of data generated by individuals travelling exceed human capability to search, manipulate as well as analyse manually. Hence, it is only realistic and pertinent to subject such amount of data to big data analytics. Exploration of big data via veracity and variety makes it pretty unchallenging to decipher tourists/prospective tourists' choices and desires of/from Agodi gardens. In connection to the tourism industries and irrespective of the industry's size, the application of big data analytics makes it easy to decipher the need and desire of tourists or visitors (Li et al., 2018). The analytics of veracity and variety of big data for Agodi gardens will help Government to make appropriate decisions in expanding the business horizon of the gardens and make the gardens meet more tourism desires of both prospective tourists and tourists. Belias et al. (2021) opined that in general, big data is capable of having significant contributions as paraphernalia that could make available the germane information for making pertinent decision. This simply because both tourists and prospective tourists' behaviors and desires can easily be deciphered by the tourism destination's management. Hence, tourism destinations will be able to put in place things and facilities that will please more tourists and pull more tourists to the destination. Hence, rather than what was obtainable in the past that just a few individuals travelled for leisure consequent upon lack of information, in contemporary times there are more information about tourism destinations for both tourists and investors (Olawuyi and Adedara, 2015). Via data mining, prospective tourists could be updated in real time about their tourism choices especially with respect to new product as well as service that such prospective tourists prefer (Olawuyi et al., 2017).

Fuchs et al. (2014) opined that the analytic tools of big data could be explored to have an indepth knowledge of the disposition of tourists in a tourism site. In the light of the results of the study the importance of predictive and subjective data analytics of big data for this study cannot be overemphasized. Data analytics can easily be used to analyze and track tourists' behavioral tendencies especially considering the fact that tourists are essentially global citizens. In contemporary times the borders of people are not constrained to where they live in

their Nation, rather it is extended to the different parts of the globe (Misirlis, 2022). Aguiar and Szekut (2020) opined that appreciation to improved software, that has made it achievable to proceed from descriptive analytics, that is the evaluation of data or contents, oftentimes operationalized through manual means, in a bid to proffer answers to "What took place?" (what is presently taking place?); prescriptive analytics is a type of improved analytics with the examination of data or contents in a bid to proffer answers to "what is going to take place?" or "how could things or situations be made to occur?".

Thus, variety and veracity of data for the study area can be examined from the trajectory of what happened or what is going to happen. This implies that data about tourists' activities while in the garden could be analyzed. Belias et al. (2021) noted that in an organization that essentially has anthropocentric character and organizations focus on people, monitor and profound analysis of the internet activities done by tourists prior to, while on and after their tours, so that the experiences could shape and improve organizational ideas. These data are capable of helping the organizations to roll out impressive initiatives that will ensure tourist get value for money spent. Likewise, the data about prospective tourists' activities at the garden can also be analyzed. The engagement of big data for the estimation or prediction of the demand of tourism is a novel skill, similarly a pertinent phase for tourism researches and profession (Cvelbar et al., 2018). In the light of technological evaluations, 'sensing socially' as a concept makes available huge volume of data which could take care of information shortage and enhanced prediction of tourists' dispositions via big data analytics, that could provide real predictions of dispositions than orthodox tourism researches (Zhang, 2018). This will enable tourism destinations to have profound knowledge of the tourism industry, predict tourists' behavior and understand the environment better. The prediction of tourist disposition can help tourism organization precisely send out the appropriate message to the target demography.

Appropriate message could be coded in promotional or advertising messages directed at the prospective tourists. Line et al. (2020) noted that big data makes available to tourism and hospitality businesses important devices in forming advertising means for ensuing the appropriate messages are passed on to the appropriate people (via the appropriate means or tools) in due time, that depicts creating value through means; improvement of efficient searching, allowance of customer relationship management, reduction in cost of transactions, and allowing customizing services. Thus, this could make the organization's response to tourists and the industry's demand timely as much as possible. Via prescriptive and descriptive analysis, organizations could have deeper knowledge of the market and detect novel and ingenious means of responding promptly to developing situations (Sivarajah, 2016). Li et al. (2022) noted that messages on social media and big data analytics has made available important perceptions and earned a lot of operations-based opinions, for helping makers of policies in determining markets flows and consumers demands, thereby, leading to the creation of market advantage over competing businesses, as they usually go in line with orthodox operational means.

It is evident that velocity, veracity and volume predict the perception that data from social media could determine level of customer patronage. Volume, velocity and value predict the perception that data from social media can be used to identify challenges tourist encounter while in the attraction. Veracity and value predict the perception that data from social media predict the perception that data from social media could decipher customer's expectation. Volume, Variety and value predict the perception that data could be used to predict future challenges and solutions. Only veracity predicts the perception that data from the study area could be used to predict strategies for enhancing organizational productivity. This is germane for the growth and development of tourism organizations, especial-

ly with respect to the different range of tourism's big data associated with such prediction. Alaei and Becken (2019) asserted that there is evidence of broad categories of the sources of big data which are topical for the travel and tourism sector, inclusive of credit card transaction, mobility induced data, behavioral tendencies associated with bookings as well as distribution of experience. The ability to predict tourist perception based on big data is capable of ultimately availing tourists' smart tourism experiences. Lee et al., (2020) noted that experiences of smart tourism is premised on solid smart organizational ecosystems at a tourism site, which is essentially operationalized via distribution of data amongst stakeholders. Xu (2023) asserted that by communicating in record time as well as information dissemination, the tourism sector procedures get better as tourists would review with ease and savor new experiences of intelligent tourism.

The characteristic of big data on the basis of variety is its ability to exist in structured and unstructured form (Hiba et al., 2015); characteristic of big data on the basis of veracity is connected to the precision and accuracy of data (Alwan, Ku-Mahamud, 2020; Carlos et al., 2018). The prospective advantage in the exploration of big data for tourism as evident in the findings of this study is in line with existing literatures. British Airways have created and infused in its operation, application and technology with the allowance of personalized perspectives of tourists and knowledge of internally and externally based conditions capable of influencing decision of shareholders (Towerdata, 2018). Similarly, online travel agents could take advantage of big volume of unstructured and structured information that stems from reviewing of online travels in a bid to have a deeper knowledge of virtual dispositions of tourists via virtual data analytics (Mariani et al., 2019). Agodi gardens has a website that can churn out big data with variety and veracity. Outside of the personal websites, big data for Agodi Gardens can be retrieved from social networking sites, just as it is done for/by other tourism destinations. The digital footprints of tourism enthusiast from social networking sites have led to the churning out of good value data links that is not restricted to businesses of tourism and its advertisement (Onder, 2017). There is the provision of participation, interaction and user focused attributes by social media which goes beyond allowing a user to talk about his/her experiences, data, perception, and others (Altinay, Taheri 2019). Rahmadian et al., (2022) noted that other social networking sites linked to the source have been operationalized for advertising tourism destinations, for instance, YouTube, Vimeo and Daily motion.

Similarly, transaction using card (payments on the spot and withdrawal of cash) are engaged as impressive sources of data in analyzing anonymous local tourism dynamic, because it engages digital source of information that is not well engaged when compared with local statistical survey (Palop et al., 2019). Aguiar and Szekut (2020) Innovative online travel companies like Amadeus have already implemented Big Data into their business strategies, to refine their products and differentiate themselves from their competitors. Hotels use the data for power system management. Big Data is flexible; when a particular need arises, it can be adapted to perform the necessary analyses and achieve positive results. In the same vein, while there is a focus on user-experience, ARTour, that is a game premised on augmented realities, was engaged for promoting agritourism via the encouragement of tourists in maintaining responsible environmental attitude, via active outdoor learning experiences (Garzon et al., 2018). Social big data had been engaged in investigating nature-based tourism through the identification of sites as well as why visitors investigate the attributes that attract them (Kim et al., 2019). On the basis of characteristics of big data, the requirements for effectively managing data, that leads to the transformation of data to important information capable of improving the attributes for making decisions (Mariani, 2019).

Conclusion and recommendations

It is worthy of note that there is connection between prescriptive/descriptive big data analytics and the characteristics of big data. Precisely, there is significant relationship between prescriptive data analytics velocity, veracity, volume and value. Similarly, there is significant relationship between descriptive data analytics and volume, variety, value and veracity. Likewise, variety and veracity of big data could influence big data analytics. The import of this is that the management of Agodi gardens can make better business decisions for their customers and organization via big data analytics by emphasizing on velocity, veracity, volume and value attributes of big data for prescriptive big data analytics, while, emphasizing on volume, variety, value and veracity for descriptive big data analytics. The study therefore recommends; that the management of Agodi Gardens should engage thorough big data analytics, so that data elicited by customers can be appropriately analysed and topical inference could be drawn from the analysis; and there should be a focus of the analytics on specific characteristics of big data, in terms of, volume, variety, veracity and value.

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TURIZAM
Volume 28, Issue 3
177–188 (2024)
ORIGINAL
SCIENTIFIC PAPER

Investigating Responsible Behavioural Approaches and Challenges for Sustainable Tourism Development in Mysore

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Received: March 2024 | Accepted: November 2024
DOI: 10.5937/turizam28-49809

Abstract

While tourists play a vital role in the sustainable development of a destination, the local community largely remains the beneficiary as well as the victim of the consequences of impacts caused by tourism activities. Hence, the growth of the destination must happen sustainably. Mysore, the heritage city of Karnataka was recently recognized as one of the cleanest cities in India. However, tourism activities adversely affect the sustainable practices of the city. The study investigates the responsible behavioural approach and challenges to develop Mysore as a sustainable tourist destination. To find this a survey was conducted on tourists and the local community. The study found that insufficient supportive services and lack of responsible behavioural practices among tourists are the challenges to the sustainable development of tourist attractions in various attractions of Mysore.

Keywords: *Responsible Behaviour, Sustainable Practices, Sustainable Tourism, Karnataka Tourism, Mysore Tourism.*

Introduction

The responsible tourism practices emerged in 20th century (Smith, 1990) had witnessed sharp growth during the 1980s (Dayananda, Leelavathi, 2016), leading to increased tourist traffic (Framba, 2020). This phenomenon resulted in overconsumption of resources which lead to resource scarcity (Sunlu, 2003), leading to the emergence of the concept of sustainable tourism practices. The growing concern with society, the economy, and the environment has led to the framing of social and environmental policies that help in the development of the senses of sustainable tourism, ecotourism, and responsible tourism, among travel stakeholders (Kiper 2013). Thus, the concept of sustainable tourism has gained the attention of tourists, service providers and especially the government and policymakers.

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Tourism as a service industry is mainly focuses on the interaction between the people and the attractions (Knowles, Westcott). As an industry that is highly sensitive towards social and physical conditions, tourism faces many challenges regarding the environment, society, and resources (Asadzadeh, Mousavi, 2017). Changes in tourism demand, economic instability, and environmental uncertainty lead to responsible practices in tourism (Khan et al., 2020). Thus, responsible tourism focuses on enhancing economic benefits, social equality and environmental integrity which is essential for maximizing the benefits to the local community (Soonthodu, Susheela, 2016)

Tourists and the local community are key drivers of responsible tourism practices (Stanford, 2006). Local authorities implement guidelines for responsible practices (Scott, 2016), tourists practice responsible tourism, and the local community is the beneficiary of the practices. The involvement of the local community is very much essential here as they are the direct and indirect beneficiaries of responsible tourism practices (Cameron, et al., 2001). Today various tourist attractions around the world are rigorously adopting responsible practices for a better future.

Tourism in Mysore

Mysore is the southernmost city of Karnataka and was the capital of the Kingdom of Mysore which ruled between 1399 AD and 1947 AD. Located at a distance of 120 km from the state capital Bangalore, Mysore is the predominant centre of tourism, art, and architecture. The total land area of the city is 286 sq. km. With an average altitude of 770 meters above sea level, Mysore welcomes its visitors with pleasant weather throughout the year.

River Cauvery is the lifeline of agricultural activities of the district. The district covers a total geographical area of 6850 sq. km of which around 10 per cent of the total area constitutes forest land and around 4850sq. km of land is cultivable. With a population of 12.35 lakh, Mysore is considered one of the most prosperous districts of the state.

Agriculture is the major source of income of the district. Industry and tourism are the promising sectors of the economy. Mysore is popular for its world-famous heritage sites, palaces, temples, parks, and sericulture. Jagmohan Palace, Art Gallery, Chamundi Hills, Mysore Zoo, KRS Dam, and the heritage sites of Srirangapattana are the major tourist attractions of Mysore. Mysore is also called the city of 'Palaces' which attracts thousands of tourists every year. The Mysore City Corporation and the District Tourism Board are promoting tourist inflow to the city and also emphasizing sustainable and responsible tourism practices in various attractions of the district. However, the growing number of tourists has led to many issues and challenges in sustainable and responsible tourism practices.

Despite COVID–19, Mysore was visited by many tourists. For instance, in September 2021, 30,425 tourists visited Mysore Palace whereas in October 2021, 26827 visitors visited the palace. Mysore's palace is visited by 6 million tourists every year, making it the second most visited monument in India. Jayachamarajendra Zoo (Popularly known as Mysore Zoo), Chamundi Hills and KRS Dam are the popular tourist hotspots of Mysore.

Literature review

Sustainable tourism aims to balance the environment, enhance socio-cultural integrity, and promote economic benefits by meeting the needs of the local community (Liu, 2013) both in marginal and developed countries (Mitchell, Hall, 2005). In other words, sustainability in the

tourism industry emphasizes enhancing socioeconomic benefits to host communities, women, and the marginalized sections of society (Cukier, 2002) so that the host region can access the benefits for a longer duration of time (Butler, 1993). Responsible tourism, a key component of sustainability, aims at maximizing the positive impact by reducing the negative consequences of tourism activities (Stanford, 2006) which can be achieved through a three-step model, i.e., setting the objectives, marketing to the most appropriate segment and visitor management system (Ford, Acott, 2015). Studies show that there is a positive relationship between attitudes towards tourism and the perceived economic benefits (Látková, Vogt, 2012). Creating and capturing value through sustainability (Ford, Acott, 2015) and emphasizing culture-based tourism products (Torn Laapio, 2019) may lead to sustainable tourism development that has a positive effect on the quality of life of residents (Lee, 2013).

Sustainable development also focuses on the green growth concept to minimize the negative impacts (George, 2019) which includes the implementation of new technologies to motivate consumers towards responsible practices (Streimikiene et al., 2020) while visiting a destination. Along with the tourists, tourism stakeholders such as travel agencies, transport companies, accommodation services, tour guides, local businesses, and the authorities have an evident role in enhancing responsible tourism behaviour (Streimikiene et al., 2020).

Tourism, being one of the largest service providers, should provide opportunities for the socio-economic development of the local communities (Hanafiah et al., 2013). Studies found that tourism also generates additional benefits for local communities by supporting small businesses, local vendors and the government (Yehia, 2019; Khan et al., 2020). At the same time, the behaviour of a tourist is likely to affect the socio-cultural, economic, and environmental perspectives of the local community (Pizam, Milman, 2014). The needs and requirements at the destination, activities that the tourist is involved in and the behaviour of the host community are the major deciding factors of sustainability (Zgollia, Zaiemb, 2018; Kiper, 2013). A positive attitude and the behaviour of tourists at the destination will have a positive impact which may guarantee the sustainable development of a destination.

Research framework

The study aims at finding the sustainable services available at the various attractions of the study area and how they are associated with sustainable practices. Mysore, being one of the tourist hotspots of India, is facing many challenges with sustainable practices. At the same time, tourists face many challenges in adopting responsible behaviour while they visit the study area.

Based on Figure 1, the study intends to examine the relationship between tourist and their responsible behaviour and how it impacts sustainable development. The role of stakeholders is crucial in implementing sustainable practices (Jonkutė-Vilkė, Staniškis, 2019) and to integrate

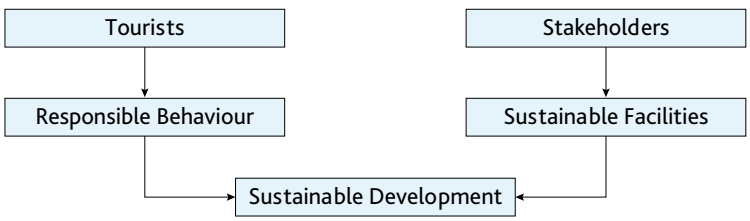

Figure 1. Stakeholder-centric Sustainable Development Model

with the service providers. This study tries to establish the relationship between the sustainable practices available at the destination and the behaviour of tourists. The study acknowledges that sustainable services available in a tourist attraction lead to sustainable behavioural practices.

The sustainable practice at the destination stands on the platform of three crucial aspects i.e., economic, environmental and social aspects of development (Allen et al., 1988; Yoon et al., 2001). The socio-cultural, economic and environmental behaviour of tourists play an evident role in sustainable development.

Methodology

A self-administered questionnaire was shared with the visitors to collect the data. Simple random sampling was used while deciding the respondents. The bio-information consisted of 5 components (age, gender, education, location and income) and the responsible behaviour of tourists was measured by 28 items based on a five-point Likert scale. To get an effective response, the questionnaire was further divided into 2 components. Sustainable practices at the destination (with three dimensions - Social, Economic and Environmental) and Challenges faced by the tourists while adopting sustainable behaviour at the destination were structured in the questionnaire.

Data collected from 400 respondents was analysed using SPSS software. %age analysis was conducted to analyse the demographic factors and KMO analysis, Principal Component Analysis and Rotated Component Matrix were conducted to identify the relationship among the different variables.

Results and Findings

Table 1. *Demographic distribution of respondents*

SL №	Demographic Variable	Category of Respondents	Frequency	%age
1	Gender	Male	185	46.3
		Female	215	53.8
2	Age	Less than 25 years	149	37.3
		26 to 35	167	41.8
		36 to 45	55	13.8
		46 and above	29	7.2
3	Occupation	Own a business	21	5.3
		Government service	18	4.5
		Private sector	183	45.8
		Agriculturist	3	0.8
		Student	151	37.8
		Others	24	6.0
4	Location	Karnataka	275	68.8
		Non-Karnataka	119	29.8
		Foreigners	6	1.5

SL №	Demographic Variable	Category of Respondents	Frequency	%age
5	Income	Less than 2 lakhs	185	46.3
		2 - 5 lakh	129	32.3
		5 - 10 lakh	56	14.0
		10 - 20 lakh	15	3.8
		20 lakh and above	15	3.8

Table 1 shows the demographic distribution of the respondents. 46.3 % of respondents are male, and 53.8 % belong to the female category. 167 (41.8 %) of respondents belong to the age group of 26 to 35 years, 37.3 % are less than 25 years, 13.8 % are 36 to 45 years, and the remaining 7.2 % are respondents above 46 years of age.

The data also reveals that 45.8 % of respondents belong to the private sector category and 37.8 % are students. 68.8 % of respondents are residents of Karnataka, 29.8 % are from outside Karnataka and the remaining 1.5 % of respondents are foreign tourists who visited Mysore.

The income distribution finds that 46.3 % of respondents have less than Rs.2 lakh income, 32.3 % have an income distribution of 2-5 lakh and 14 % are in the category of Rs.5-10 lakh

Simple mean analysis

The Simple Mean Analysis shows the average value of the responses chosen by the respondents. Charts 1 to 4 show the average value of responses on the availability of sustainable environmental resources, sociocultural resources, economic resources and the challenges faced by the tourists while visiting the study area. A glimpse of the overall response is shown in the charts below.

The Simple Mean Analysis shows the average value of the response chosen by the respondents. Chart 1 shows the average value of responses on the availability of sustainable environmental resources at the destination. Availability of Electric vehicles at the destination (Mean

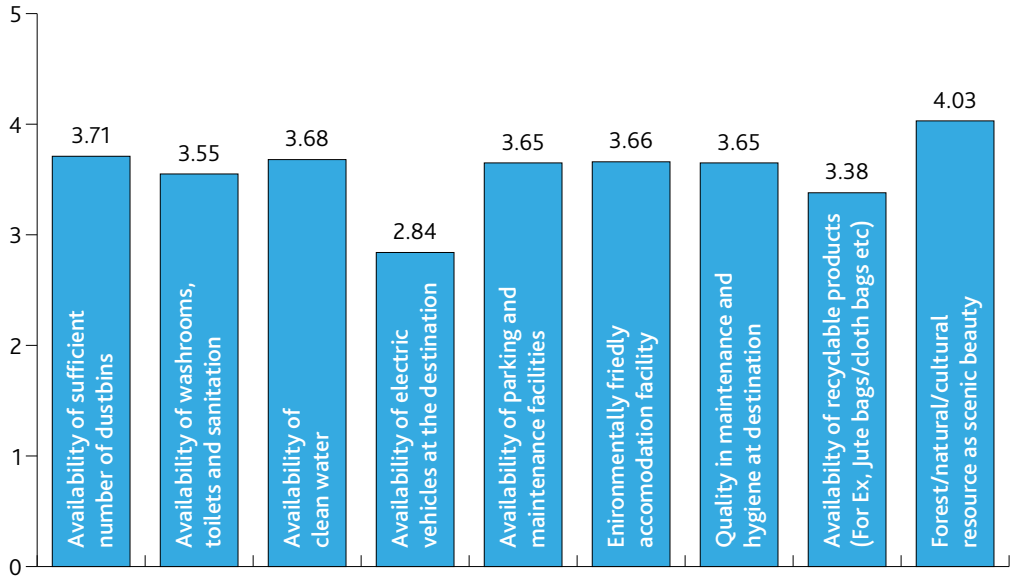

Chart 1. Availability of sustainable environmental resources

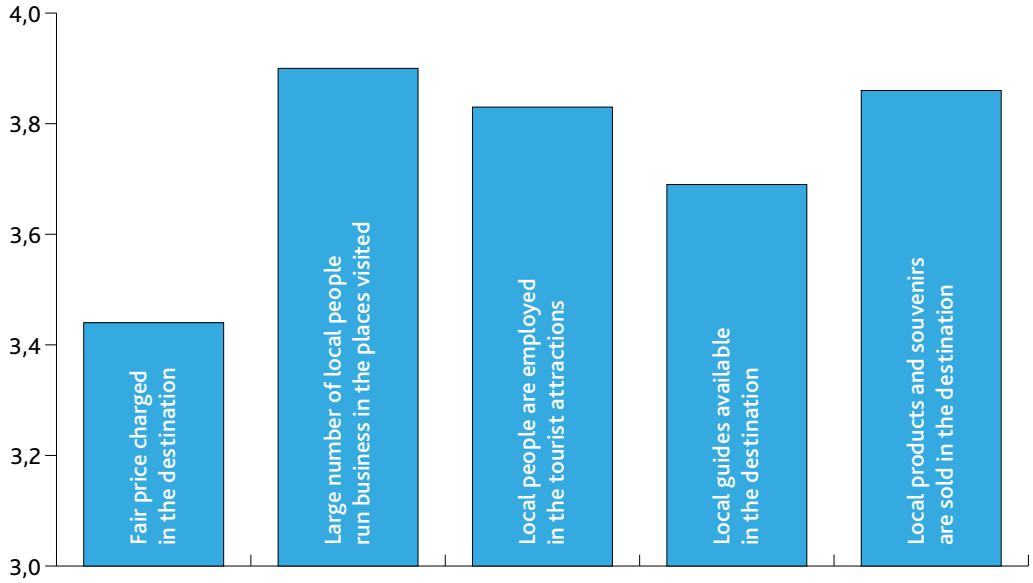

Chart 2. Availability of sustainable economic resources

= 2.84) shows the low significance of responses wherein both natural and cultural resources at the destination hold the highest significance (Mean = 4.03).

Chart 2 shows the average value of responses on the availability of sustainable economic resources at the destination. Low price charged in the destination (Mean = 3.43) shows the low significance of responses wherein a large number of local people running the business has the highest significance (Mean = 3.90).

The Simple Mean Analysis (Chart 3) represents the availability of sustainable cultural and safety resources at the destination. Tourist safety and security has the highest significant

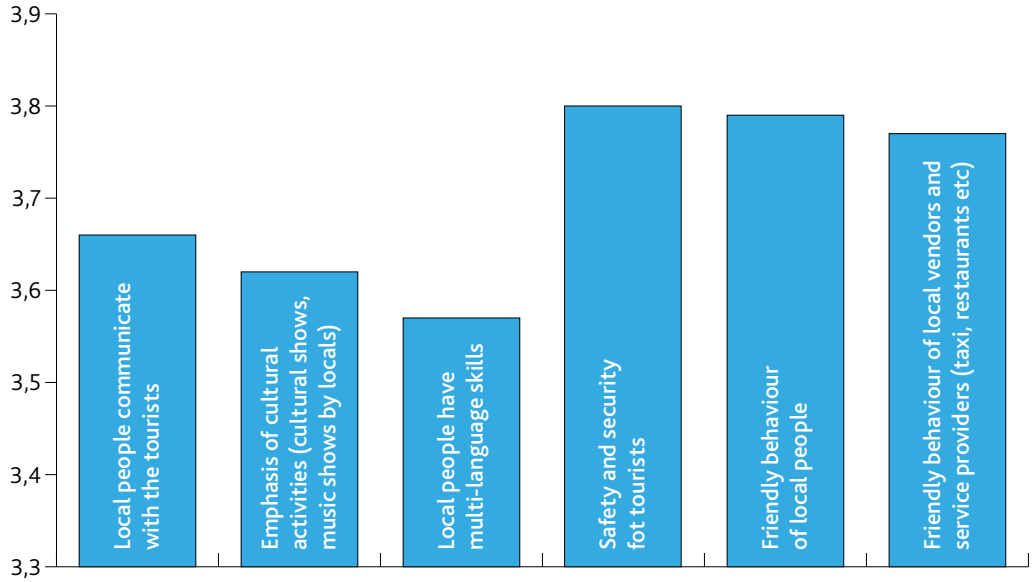

Chart 3. Availability of sustainable cultural and safety resources

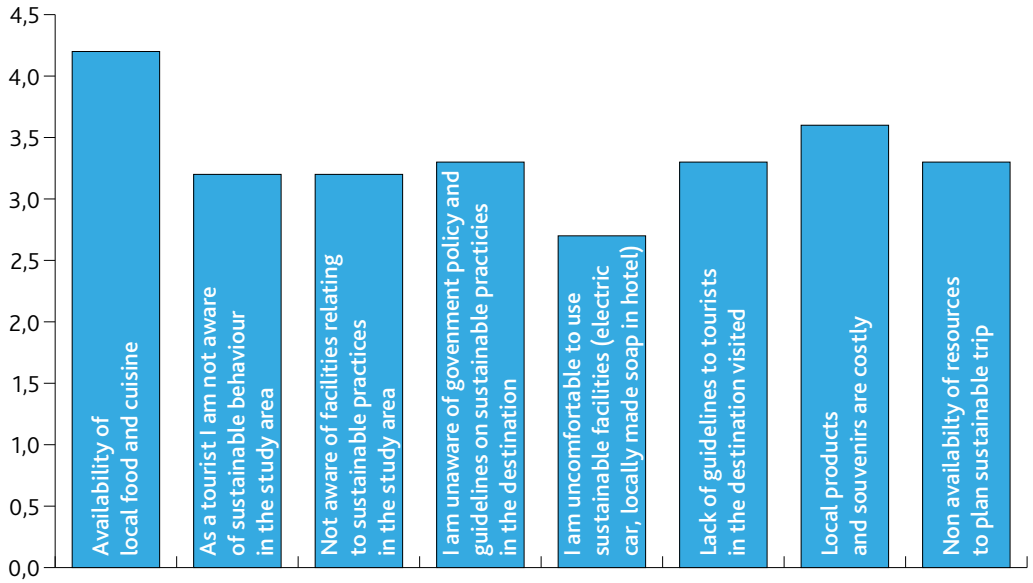

Chart 4. Challenges in practicing responsible behavior at the destination

value (Mean = 3.80) and the multi-language skills of local people hold the low significant value (Mean = 3.53).

Chart 4 interprets the challenges in practising responsible behaviour at the destination. Tourists uncomfortably using sustainable facilities such as Electric cars, locally made soap in hotels etc (Mean = 2.75) show the low significance of responses wherein availability of local food and cuisine has the highest significance (Mean = 4.20).

KMO Analysis

The factor analysis was run on collected responses for all the 28-item questions in the questionnaire. KMO and Bartlett's test shows significant adequacy with a KMO value of .878 (>.5) and significance at a 5% level (p = .000<.05) (Field, 2013). The test shows the significant relationship between the variables. The significance value 'o' withstands the highest reliability on the results.

Table 2. *KMO and Bartlett's Test Analysis*

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.878
Bartlett's Test of Sphericity	Approx. Chi-Square	6251.054
	Df	378
	Sig.	.000
a. Based on correlations		

Table 3. *Total variance analysis 2*

	Component	Initial Eigenvaluesa			Rotation Sums of Squared Loadings		
		Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
Raw	1	10.335	33.921	33.921	5.816	19.088	19.088
	2	3.575	11.734	45.655	4.692	15.399	34.487
	3	1.874	6.149	51.805	2.826	9.275	43.762
	4	1.599	5.249	57.054	3.092	10.149	53.911
	5	1.433	4.702	61.756	2.179	7.152	61.063
	6	1.123	3.686	65.442	1.334	4.379	65.442
	7	1.037	3.405	68.847			
	8	.966	3.171	72.018			

Table 2 interprets the eigenvalues and the rotation sums of squared loadings on the components if it shows factor loading 0.40 or greater (Field, 2013). The output produced six components based on the grouping of variables set in the questionnaire. Availability of resources (social, cultural and economic) and the challenges faced by the tourists during their visit to the destination are the major components of grouping.

Demographic analysis was conducted to determine the demographic distribution of the respondents. The study found the dominance of female travellers over the male. The majority of the respondents, who visit Mysore are aged between 26 and 35 years and belong to the private sector. Mysore is dominant in attracting domestic tourists. Though income is a prominent factor in the tourism industry, the study found that the majority of respondents belong to the income category below two lakh per annum.

Environmental, Economic and Socio-cultural factors are the basic pillars of sustainable practices. To understand the tourists' perspectives on these factors, several variables were identified and grouped under each category. Each factor holds significant value and influences responsible behaviour at the destination. The simple Mean Analysis on the availability of sustainable environmental resources found that natural and environmental resources (Mean = 4.03) hold the highest significance under group 1 (Availability of Sustainable Environmental Resources) and the availability of modern sustainable amenities such as Electric vehicles (Mean = 2.84) is the least preference among the tourists.

Group 2 (Availability of sustainable economic resources) in mean analysis has broader significance in the study as local community benefit is involved in it. The result shows a positive perspective of the involvement of the local community in running the tourism-related business (Mean = 3.90). However, the study also shows a relatively low response towards the price charged in the destination (Mean = 3.43).

Group 3 in the mean analysis represents the availability of sustainable cultural and safety resources in the destination. Tourists are highly satisfied with the safety and security measures (Mean = 3.80) available at the destination. The study also found that language skills as one of the weaker representations of sustainable cultural and natural resources.

Group 4 in the mean analysis is the representation of challenges faced by the tourists while practising responsible behaviour in the study area. Tourists are delighted with the food and cuisine available at the destination (Mean = 4.20) while not happy with the sustainable facilities offered at the destination (Mean = 2.75). This could be the hindering factor for promoting responsible behaviour in the destination.

KMO and Bartlett's test shows significant adequacy with a KMO value of .878 (>.5) and significance at a 5% level (p = .000<.05) showing the significant relationship between different variables that are considered for the study. The study also found that the availability of sustainable environmental resources at the destination has a greater degree of relevance in the study (Initial Eigenvaluesa value 10.335) and the availability of sustainable economic resources at the destination (Initial Eigenvaluesa value 3.575) becomes the other factor of consideration among the respondents.

Discussion

Responsible behaviour in tourism is determined by the quality of sustainable infrastructure available in a destination. Studies showed that there is a direct relationship between the quality of sustainable resources and the responsible behaviour of tourists. Though Mysore is a world-known tourist destination, the number of non-Karnataka and foreign tourists visiting different attractions is relatively very low. Mysore Palace, Chamundi Hills, KRS Dam and Mysore Zoo are the few sights that tourists prefer to visit. However, many other beautiful attractions need strategic promotional activities to attract more tourists. Low support from the customers at the destination is one of the barrios for growth in sustainable tourism (Budeanu, 2007). The local authorities and the service providers should induce the tourists to buy local products, choose environmentally friendly transportation and respect the local community. Promoting the appropriate practices and indulging tourists in various activities by making them the co-managers, co-designers and co-creators of tourist experiences enhances the belongingness towards a destination (Shen et al., 2020).

The service facilitators need to utilize social networks to influence smart tourists (Shen et al., 2020) to promote Mysore as one of the sustainable tourism hubs. Consumer awareness of sustainable practices is still an under-researched area that needs high attention (Penz et al., 2017). The study found that tourists are biased with the products offered to them hence appropriate labelling of tourism products needs to be carried out to increase the awareness and knowledge about sustainability among the travelers. Three core components of sustainable promotion i.e., awareness, agenda and action (Mihalic, 2019) need to be considered for successful implementation of sustainable practices at the destination.

Sustainability and responsibility need a solid understanding of the process of how a responsible destination implements a sustainability agenda (Mihalic, 2019). Mysore being one of the cleanest cities has to focus on the introduction of sustainable infrastructure to promote responsible behaviour. The lack of sufficient electric vehicles and the lack of availability of recyclable products are some of the environmental threats that the destination is facing today. At the same time, biased pricing at the destination and the non-availability of sufficient guide facilities are hindering responsible behavioural practices at the destination. Special training and workshops need to be organized emphasizing on improvement of communication skills and cultural manifestation among the local people who are associated with the tourism business. Tourism, environmental and transport policies need to integrate better to create sustainable development (Peeters et al., 2016). As tourist awareness about sustainable practices is the focal point, awareness camps can be organized. Mysore also needs a sustainable tourism circuit that could cater for the needs of special interest tourists. Eventually, special training for service providers, attractive incentives and subsidies, and moral and financial support for those service providers who implement sustainable practices at the destination.

Conclusion

The study highlights the role of every stakeholder in successful implementation of any kind of activity in a destination. Mysore, being one of the top tourist destinations, has maximum potential to attract millions of tourists every year. Though the number of tourists visiting Mysore is gradually increasing, attitude towards sustainable practices and responsible behaviour still demands the intervention of the authorities and the policy makers. As the respondents rightly highlighted, the destination requires innovative strategies to create awareness on responsible behaviour among the tourists. Local business agencies and the government authorities need to focus on offering sustainable products and services to promote responsible behaviour among the tourists. Developing quality infrastructure, employing local people in tourism activities, promotion of local products and proper guidance to every stakeholder involved in tourism business may drive Mysore tourism into greater heights.

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TURIZAM
Volume 28, Issue 3
189–205 (2024)
ORIGINAL
SCIENTIFIC PAPER

Navigating Tourism Potential and Environmental Limits: A Suitability Analysis of Pal Beach (Indonesia) as an Emerging Coastal Recreational Destination

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Received: March 2024 | Accepted: October 2024
DOI: 10.5937/turizam28-49650

Abstract

This study evaluates the suitability of Pal Beach in North Sulawesi, Indonesia, as a recreational beach tourism destination. Ten key parameters influencing beach tourism are assessed, including water depth, beach type and width, seabed material, vegetation, water clarity, currents, harmful marine life and freshwater availability. Data were collected through field measurements and observations. Data were analyzed to determine the Tourism Suitability Index for Beach Recreation, applying the Suitability Index. Results classify Pal Beach as 'Very Suitable' with a score of 2.82. The beach boasts features like shallow coastal waters, sandy white shores, ample width, good water visibility, coconut trees and gentle slopes catering to visitors. However, strong currents exceeding ideal speeds, the presence of stonefish and sea snakes, and limited onsite freshwater pose notable challenges needing mitigation for its sustainability. By analyzing tourism viability while identifying environmental constraints, this assessment contributes insights to guide the integrated management of emerging recreational destinations in Indonesia based on globally accepted principles of responsible, sustainable development.

Keywords: *Coastal tourism, Suitability analysis, Recreational activities, Pal beach*

Introduction

Pal Beach, situated within the Likupang Tourism Special Economic Zone (SEZ) in North Sulawesi, Indonesia, has rapidly become a sought-after coastal recreation hub. Its 2019 integration into the Likupang Special Economic Zone marked a milestone for tourism facilities improvement. Additionally, its selection for the national super-priority destinations program has boosted growth (Lagarense et al., 2022). However, research comprehensively evaluating its capacity for sustaining tourism based on environmental parameters remains lacking.

As Indonesia balances utilization and conservation across valued coastal zones, tourism assessments take on vital significance. Law No. 32/2014 mandates the sustainable management

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of marine resources, necessitating ongoing monitoring of recreation areas to determine preservation needs or rehabilitation efforts (Wullur et al., 2022). Frameworks integrating carrying capacity and sustainability concepts further reinforce responsible development aligned to ecological limits (Brummett et al., 2023; Yin et al., 2022).

This study aims to advance knowledge on evidence-based coastal tourism assessment by evaluating ten key parameters of Pal Beach related to recreational suitability and sustainability. The analysis intends to classify its current state and tourism prospects while revealing any limitations requiring addressing through integrated management strategies. Findings can shape policies on balanced tourism growth in Indonesia's expanding industry.

Globally, beach evaluations employ various indicators of physical infrastructure, water quality, climate risks, biodiversity, and community participation (Rudan, Nižić, 2018; Rutty et al., 2020). Assessments precisely gauging recreational viability analyze factors like accessibility, visual aesthetics, substrata suitability and hazardous marine life risks (Augustine et al., 2022; Carlos et al., 2023). Few other studies apply integrated approaches examining the aspects of interconnected environmental, social and economic sustainability. This paper analyses Pal Beach across diverse ecological parameters vital for recreation and conservation, contributing to interdisciplinary understanding at the intersection of tourism development and the management of coastal resources.

Literature Review

Introduction and background on assessing beach tourism suitability

Pal Beach, recently designated as a leading beach destination in North Sulawesi's Likupang Tourism Special Economic Zone, has exciting potential for sustainable tourism development. However, its capacity for recreational activities has never been comprehensively assessed from a sustainability perspective.

This study aims to fill that gap by evaluating ten key ecological parameters of Pal Beach: water depth, beach type, width and slope, substrate, land cover, water clarity, currents, harmful biota, and freshwater availability. By analyzing these indicators, we will determine the beach's tourism prospects while identifying any environmental constraints that must be addressed.

Overall, this research intends to advance knowledge on evidence-based, sustainable coastal tourism using Pal Beach as a case study. The results can inform tourism practices in Indonesia and abroad.

Studies evaluating beach tourism suitability employ diverse parameters and methods. Physical aspects like infrastructure and dangerous biota estimate tourism carrying capacity (Kelana et al., 2022). Climatic suitability and shoreline loss projections correlate with recreational beach use (Zajch et al., 2022). Additionally, online reviews inform positioning strategies to enhance beach destination value (Taecharungroj, 2022).

Beach-specific assessments consider water clarity, currents, accessibility, scenery, and community inclusion (Augustine et al., 2022; Phelan et al., 2020; Rudan, Nižić, 2018). Sand-based substrates are preferred over coral or mud for aesthetics and recreational suitability (Carlos et al., 2023). Integrated approaches emphasize preserving natural and cultural heritage while enabling community-driven economic growth (Phelan et al., 2020).

Climate projections for beach destinations assist tourism demand forecasts and suitability analyses (Gómez-Martín et al., 2020; Rutty et al., 2020). Comprehensive, sustainable

frameworks assessing physical, climatic, social, and management dimensions produce valuable insights for beach tourism development.

Beach assessment in Indonesia: a multidisciplinary exploration of global frameworks for sustainable management

Beach assessment research in Indonesia utilizes a multidisciplinary framework encompassing environmental, ecological, geological, and social dimensions. Recent foci include analyzing iron sand characteristics, intertidal biodiversity, marine debris, and mangrove sustainability (Hayati et al., 2020; Purwanti et al., 2021; Suardana et al., 2022; Susintowati et al., 2019). Methodologies span geospatial mapping, user perception surveys, tourism site selection models, and suitability analyses (Ambarwati et al., 2021; Hadiwijaya et al., 2018; Pattipawaej, Hardiyan, 2020).

Several studies evaluate sustainability, physical parameters, and visitor preferences to determine tourism potential, such as in Central Java, Yogyakarta, East Java, and West Papua (Hidajat et al., 2020; Saptutyningsih, Duanta, 2021; Sahirudin et al., 2023). However, assessments in North Sulawesi remain lacking despite growing popularity.

Therefore, this multidisciplinary research aims to fill the gap by evaluating Pal Beach in North Sulawesi across ten ecological parameters, providing insights into its tourism prospects while considering sustainability needs.

Diverse frameworks guide sustainable beach tourism practices and standardize assessments globally. These include Tourism Competitiveness Indices evaluating visitor satisfaction, infrastructure, and environmental sustainability (Rodríguez-Díaz, Pulido-Fernández, 2019). Policy and Regulation Frameworks address governance and legal considerations (Machado et al., 2021), while Inter-institutional Relationship Models foster collaboration among institutions (Parmawati et al., 2021).

Additional frameworks analyze carrying capacity, climate suitability, economic value, urbanization, conservation, and recreation (Gómez-Martín et al., 2020; Guo et al., 2019; Moosammy et al., 2022; Ritphring et al., 2023). Certification programs like Blue Flag and Green Flag recognize beaches meeting environmental, sustainability and safety criteria (Mooser et al., 2022; Uebelhoer et al., 2021).

Region-specific assessments evaluate aspects like beach safety knowledge, drowning prevention, COVID-19 impacts, and tourism offerings (Belucio et al., 2022; Cruz-Milán, Puls, 2021; Uebelhoer et al., 2021; Woods et al., 2022). Emerging methodologies utilize UAVs, spatial modeling, system dynamics, and more (Wiartha et al., 2022).

These interdisciplinary frameworks significantly contribute to standardized global beach assessments and sustainable management. This study aligns with globally accepted principles by evaluating parameters important for beach recreation from a sustainability perspective.

The strategic framework for sustainable tourism management integrates diverse approaches promoting sustainable livelihoods, conservation, and development. Methodologies include the Sustainable Livelihood Approach and indicator systems applied in the Sustainable Tourism Livelihood Framework (Shang et al., 2021). Additionally, the A'WOT analysis aligns strategies with regional visions and sustainability goals (Kişi, 2019).

Incorporating Sustainable Development Goals (SDGs) enables analyzing sustainability across economic, social, and environmental realms (Seraphin, Gowreesunkar, 2021). Digital integration through smart tourist cities transitions traditional frameworks to meet sustainable development needs (Bazazo et al., 2022).

Furthermore, strategic plans integrate carrying capacity to identify policies supporting sustainability based on ecological limits (Candia et al., 2020). These frameworks address complex tourism challenges while ensuring socio-economic benefits and environmental conservation.

Suitability analysis in beach tourism

Suitability indexes have emerged as standardized quantitative tools for assessing sustainable beach tourism. Augustine et al. (2022) exemplify this through their analysis of parameters like water depth and slope to determine the tourism suitability of Dreamland Beach. Similarly, Insani et al. (2019) apply the Travel Suitability Index and SOAR method to evaluate ecotourism suitability and propose management strategies for Pantai Ungapan.

Oktafianti et al. (2021) also utilize an Index of Tourism Suitability and suitability matrix, based on the work of Yulianda (2019), encompassing factors like water clarity and land cover to assess marine tourism conditions at Balangan Beach.

These integrated suitability assessments synthesize diverse data into interpretable indexes to inform tourism planning and management. This study applies these globally accepted methodologies to evaluate the sustainable tourism potential of Pal Beach.

Summary and purpose statement

This review synthesizes beach tourism assessment, sustainable development frameworks, suitability indices, and Indonesian and global contexts. Key gaps emerge. Integrated suitability analyses covering diverse parameters remain limited, especially for emerging Indonesian destinations like Pal Beach. Assessing sustainability alongside economic growth is also needed.

Therefore, this empirical study conducts an integrated suitability assessment of Pal Beach across ten ecological parameters important for recreation. The Index of Tourism Suitability evaluates its capacity as a sustainable destination. Findings provide insights to guide responsible tourism development, extending data-driven beach management knowledge in Indonesia's expanding industry. Overall, this research exemplifies integrating sustainability into tourism growth strategies.

Methods

Location and time of research

The research was conducted at Pal Beach, in Marinsow Village, East Likupang District, North Minahasa Regency, North Sulawesi Province, Indonesia (Figure 1), over seven months, from January to July 2023.

Data collection method

Data collection used a quantitative descriptive approach to gather primary and secondary data. Primary data comprised the Tourism Suitability Index (IKW) parameters for beach recreation, including beach type, beach width, water bottom material, water depth, water brightness, current speed, beach slope, land cover, harmful biota, and freshwater availability (Oktafianti et al., 2021). Secondary data were sourced from various journals, books, and official reports. Harm-

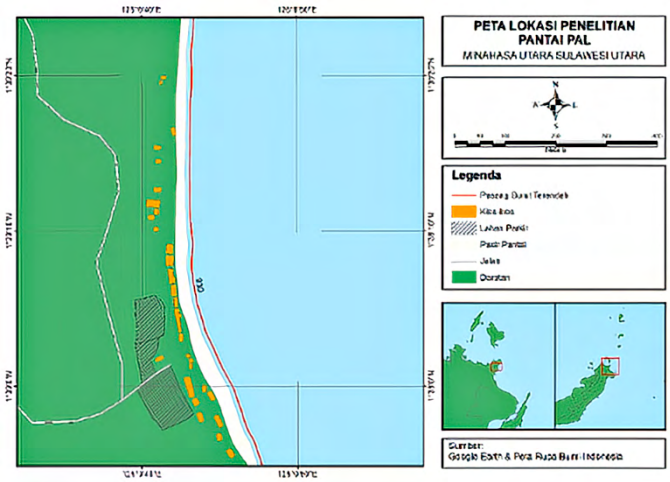

Figure 1. Research location
Source: Author's

ful biota observed directly in the field were identified using identification guides and other relevant references.

Data were collected through field measurements and observations conducted at sea and on land (Habibi et al., 2017). Marine data encompassed water depth, substrate, brightness, current speed, and the monitoring of harmful biota. On land, measurements included beach type, beach width, land cover, and freshwater availability.

a) ***Water Depth***
Depth measurements were taken at each station using a scale pipe or measuring stick inserted into the water until it touched the bottom substrate (Habibi et al., 2017). The recorded value on the scale pipe or measuring stick represented the depth measurement (Oktafianti et al., 2021).

b) ***Beach Type***
The beach type was determined through visual observation, examining sand type, color, and grain texture (Chasanah et al., 2017). This observation covered subtidal, intertidal, and supra-tidal areas (Habibi et al., 2017).

c) ***Beach Width***
Beach width was measured using a roll meter from the lowest tide to the last vegetation on the beach, with measurements taken perpendicularly from the sea to the land (Habibi et al., 2017; Oktafianti et al., 2021).

d) ***Beach Substrate***
Data on aquatic bottom material were obtained through direct observation at the research stations, including sand, silty sand, or mud (Oktafianti et al., 2021). Grain size analysis was conducted by sieving sediment samples collected at the research site and analyzed using the Miller Triangle method (Habibi, 2017).

e) ***Beach Slope***
Beach slope measurements were conducted using a roller meter and a 2-meter scale stick. Based on the horizontal height and length, the angle formed between the horizontal and vertical lines was used to calculate the beach slope (Oktafianti et al., 2021). Following was the formula used:

$$arc\tan = \frac{y}{x}$$

α was the angle formed (°); y was the horizontal height; and x was the horizontal length.

f) ***Beach Land Cover***
Land cover data were obtained through visual observation around the beach, encompassing vegetation, plantations, settlements, and buildings (Chasanah, 2017; Oktafianti et al., 2021).

g) ***Current Speed***
Measurement of current velocity involved using a moving current ball at 5 meters and a stopwatch to record travel time (Habibi et al., 2017; Oktafianti et al., 2021). The current velocity was calculated using the following formula:

$$V = \frac{s}{t}$$

Description:
V = current speed (m/s)
s = length (m)
t = time (s)

h) ***Water Brightness***
Brightness measurements were conducted using a Secchi disc. The depth at which the black-and-white color on the device was no longer visible and, when it became visible again, was recorded, along with the depth of coastal waters (Habibi et al., 2017).

$$C = 0.5\frac{(m+n)}{z}\cdot 100\%$$

Description:
C : Brightness (m).
m: Depth (when the Secchi disc border is not visible).
z: Depth of Water (m).
n: Depth (when the secchi disc boundary becomes visible)

i) ***Harmful biota***
Information on harmful biota was gathered through interviews with residents and observations around the beach, including snorkeling, to explore coastal waters to a certain depth.

j) ***Freshwater Availability***
Freshwater availability information was obtained from interviews with residents and beach tourist attraction managers. The distance between each research station and the nearest freshwater source was measured using GIS software, such as Sasplanet or Google Earth Pro (Habibi et al., 2017; Oktafianti et al., 2021).

Data analysis

Resource suitability analysis was conducted by calculating the Tourism Suitability Index, outlined by Yulianda (2019). Parameters were scored and weighted based on predefined criteria, as presented in Table 1.

Table 1. *Resource suitability parameters for beach tourism beach recreation category*

№	Parameters	Category	Score	Weight
1	Water Depth (m)	0-3 3-6 >6	3 2 1	0,125
2	Beach Type	Sandy Composing Muddy, Rocky, Cliffs	3 2 1	0,200
3	Beach Width (m)	>15 10-15 <3-10	3 2 1	0,200
4	Water Substrate	Sand Silty sand Mud	3 2 1	0,170
5	Beach slope (°)	‘10 10 - 25 ‘25 - 45 ‘ 45	3 2 1 0	0,080
6	Beach land cover	Coconut, open land bush, scrub, low, savanna Tall scrub, mangrove forest, settlement, harbor	3 2 1 0	0,010
7	Current speed (m/s)	0-0,17 0,17-0,51 >0,51	3 2 1	0,080
8	Brightness (m)	>10 >5-10 3-5	3 2 1	0,125
9	Harmful Biota	None Jellyfish, Sea snake Jellyfish, sea snakes, sea urchins and lepu	3 2 1	0.005
10	Freshwater Availability (km)	<0,5 >1-2 >2	3 2 1	0,005

Source: Yulianda, 2019

The Tourism Suitability Index (IKW) calculation refers to Yulianda (2019).

$$IKW = \sum_{i=1}^{n} \left(B_i \cdot S_i \right)$$

n = Number of fit parameters
B_i = Weight of parameter i
S_i = ith parameter score

Description:
Very suitable: IKW ≥ 2.5
Compliance: 2.0 ≤ IKW < 2.5
Unsuitable: 1≤ IKW < 2.0
Very unsuitable: IKW < 1

Results

The results of assessing resource suitability parameters for recreational beach tourism at Pal Beach in Marinsow Village, East Likupang District, Minahasa Regency, are summarized in Table 2. Ten parameters were calculated to determine the tourism suitability index for Pal Beach.

Table 2. *Calculation results of resource suitability parameters for beach tourism beach recreation category*

No.	Parameters	Calculation Result
1	Water Depth (m)	1 - 2,6
2	Beach Type	Sandy
3	Beach Width (m)	148
4	Water Substrate	Sand, rock, dead coral
5	Beach Slope (°)	7
6	Beach Land Cover	Coconut, trees, open land
7	Current speed (m/s)	1,17
8	Brightness (m)	68
9	Harmful Biota	Stingray, sea snake, stonefish
10	Freshwater Availability (km)	2,4

The data collected from the recreational beach area of Pal Beach yielded valuable insights. The results show that the beach's depth ranges from 1 to 2.6 meters, making it suitable for various water activities. Coastal waters exhibit a current speed of 1.17 meters per second, and the water is remarkably bright, with a visibility depth of 68 meters. Pal Beach boasts an impressive width of approximately 148 meters (about 485.56 ft), complemented by a gentle slope of 7 degrees. It is characterized as a sandy beach featuring a diverse beach composition, including sand, rocky sand, and sections with dead coral. Furthermore, the beach is adorned with coconut trees, other varieties of trees, and open land, enhancing its natural appeal and suitability for recreation.

The results also identified the harmful biota that inhabited the coastal waters, such as rays, sea snakes, and stonefish. Additionally, it was noted that fresh water was accessible near the beach, albeit sourced from a location 2.4 kilometers distant from Pal Beach.

The analysis of resource suitability for beach tourism in the beach recreation category at Pal Beach, based on the results of the ten parameters, was presented in Table 3. Pal Beach fell within the "Very Suitable" category with an Index of Tourism Suitability (IKW) value of 2.82.

Table 3. *Analysis of resource suitability for beach tourism beach recreation category at pal likupang beach*

№	Parameters	Calculation Result	Score (B_i)	Weight (S_i)	$B_i \times S_i$
1	Water Depth (m)	1- 2,6	3	0,125	0,375
2	Beach Type	Sandy	3	0,200	0,6
3	Beach Width (m)	148	3	0,200	0,6
4	Water Substrate	Sand, rock, dead coral	3	0,170	0,51
5	Beach slope (°)	7	3	0,080	0,24
6	Beachland cover	Coconut, trees, open land	3	0,010	0,03
7	Current speed (m/s)	1,17	1	0,080	0,08
8	Brightness (m)	68	3	0,125	0,375
9	Harmful Biota	Stingray, sea snake, *stonefish*	1	0.005	0,005
10	Freshwater Availability (km)	2,4	1	0,005	0,005
					2,82

Despite Pal Beach's high suitability rating in the Tourism Suitability Index (IKW), it is crucial to address three critical parameters to ensure the long-term sustainability of this beach as a recreational tourist destination. These critical parameters are current speed, harmful marine life, and freshwater availability.

Discussion

The comparative analysis reveals Pal Beach's exceptional suitability as a beach tourism destination, meeting several pivotal criteria. However, certain limitations pose notable challenges requiring mitigation strategies.

Water depth: a visitor-friendly sanctuary

The research uncovered shallow waters ranging from 1 to 2.6 meters, aligning seamlessly with ideal depths for secured swimming and recreation (Ariefianda et al., 2019). Compared to destinations with deeper waters, the shallow depth enhances enjoyment and safety, enabling more visitors to access and participate in water activities confidently (Oktafianti et al., 2021). The water depth involves shallow wading areas suitable for children and elderly visitors. However, changes in water levels during tides require marked swimming zones with warnings to avoid overexertion risks.

Beach type - pristine shores with natural defenses

The expansive sandy beach absorbs wave energy, providing a natural buffer against erosion (Hanley et al., 2014). This type of beach enables dynamic adaptation to fluctuating wave conditions, preserving aesthetic beauty and accessibility despite severe weather events (Scott et al., 2016). Preserving the integrity of Pal Beach's sandy composition through sustainable land use and conservation is paramount for maintaining this natural defense and tourist appeal.

Beach width - spacious recreational area

An impressive 148-meter width surpasses guidelines for tourist destinations (Yulianda, 2019), enabling diverse amenities placement while hosting various recreational pursuits without congestion even during peak capacity. However, capacity planning and zoning of activity areas can optimize visitor traffic flow. As Bustos et al. (2021) highlighted, monitoring usage patterns during tidal fluctuations informs strategic infrastructure decisions. Thus, demarcating activity zones can better assist visitors with disabilities.

In addition, Pal Beach, spanning 930 meters (about 3051.18 ft), is a prominent tourist destination influenced by property values and coastal appeal. Its extensive dimensions cater to various activities, requiring effective visitor safety and satisfaction management, including amenities like lifeguard stations (Boto-Garcia, Leoni, 2023).

Beach substrate: diverse seabed composition

The predominantly sandy bottom with sporadic rocky sand and coral fragments provides visitors with a multifaceted recreational setting. With its pristine white sandy surface, the beach perfectly suits recreational beach tourism (Saraswati et al., 2023), aligning seamlessly with visitors' preferences and enhancing Pal Beach's appeal. Conservation efforts prioritizing these unique substrates preserve ecological integrity while sustaining aesthetic charm.

Beach slope - gradual inclines for accessibility

The gentle slope facilitates safer swimming and easy water access (Ariefianda et al., 2019). It also enables visitors of all mobility levels to access and traverse the beach with relative ease compared to steeper shores (Anfuso et al., 2021). Pal Beach's gentle beach slope, measured at around 7^0, clearly positions it as an excellent choice for recreational tourism. To sustain it as a top tourist spot, prioritize preserving its natural slope and avoid human-induced alterations that could compromise safety and aesthetics.

Beach land cover - scenic beauty and ecological equilibrium

Lush coconut trees and vegetation complement the idyllic sandy shores, attracting nature-loving tourists (Yufaraj et al., 2023). The unique blend of beach land cover significantly contributes to its exceptional suitability, but uncontrolled changes can degrade ecological balance and aesthetic charm (Aji, Faniza, 2021). To address this, prioritized comprehensive management strategies, including sustainable land use practices, afforestation, and heightened oversight, are essential for striking a harmonious balance between tourist development and ecological preservation.

Water brightness – preserving pristine clarity

The 68-meter visibility signifies minimal pollution and ecosystem harm, attracting tourists while sustaining marine habitats (Agustine et al., 2022). Compare this to the blurry visibility caused by congestion and beach litter, particularly in popular beach destinations like Bali (Rahma, 2020). Strict regulation of waste disposal and runoff into coastal waters is imperative to maintain this pristine water quality.

Strong current - an ongoing safety challenge

The 1.17 meters per second current surpasses the 0.16 meters per second safety threshold (Reyes et al., 2020). Designating swimming areas based on the mapping of weaker currents is vital. Management should install clear warning signs and train lifeguards for oversight and emergency response based on high-risk zones within the beach. Continual visitor education is equally critical for promoting self-awareness of dangers.

Harmful biota - navigating coexistence

Documented sightings of venomous rays, sea snakes and stonefish pose safety hazards that warrant strategic actions like warning signs, first aid management and zoning of recreational areas to avoid encounters (Geng et al., 2023). However, beach closures during seasonal migration periods of hazardous marine species may be unavoidable despite impacting tourist activity. Another approach is to dissuade visitors from touching or disturbing marine life and advocate for designated swimming areas with a lower chance of encountering hazardous biota, minimizing risks.

Freshwater source - optimizing accessibility

The distant water source 2.4 km away inconveniences visitors wanting to rinse post-swimming and indirectly discourages beach activities (Yulianda, 2019). Establishing storage and pumping facilities within 500m (about 1640.42 ft) based on utilization forecasts caters better to visitor comfort without excessive resource or environmental impact.

In summary, while Pal Beach shows incredible potential as a beach tourism destination hosting recreational activities, realizing its potential requires mitigating limitations through an integrated approach focused on visitor wellbeing, safety, ecological conservation, and sustainability principles to enable enduring and responsible growth.

Comparative discussion

While Pal Beach possesses notable strengths as a prospective beach tourism destination, it also faces limitations in certain aspects. Comparing and contrasting the findings to established beach tourism sites provides meaningful insights.

The gently sloping sandy shores align closely with the features of renowned beaches like Bondi Beach in Australia, applauded for its accessibility, family-friendly waters and picturesque landscape that draws over 2.8 million visitors annually (Australian Government Department of the Environment and Water Resources, 2007; Moskovska, 2021). However, Bondi mitigates risks like rips through lifeguard surveillance over its long coastline (Warton et al., 2017). Similar risk management strategies tailored to local contexts strengthen Pal Beach's capability.

Like Pal Beach, Boracay Island in the Philippines rose to fame as an idyllic vacation spot acclaimed for its powdery white sand beaches and energetic beach activities. However, rapid unconstrained tourism growth degraded its environment, prompting authorities to close the island temporarily for rehabilitation (Maming et al., 2021). The careful reopening of Boracay, employing strategies such as visitor caps, enhanced waste management infrastructure, community participation, and impact monitoring, has proven effective in ensuring its preservation. These successful approaches can also be applied to safeguard Pal Beach to avoid potential environmental degradation,

The rapid growth of Punta Cana in the Dominican Republic from pristine beaches into an iconic coastal mega-resort exemplifies the lucrative potential and pitfalls of unchecked tourism expansion that Pal Beach should avoid. Excessive hotel developments, poor resource management and lagging infrastructure amidst surging visitors have damaged ecosystems and excluded locals (Goffi et al., 2020). This situation underscores the urgent need, as pointed out by Kai and Lintong (2023), for integrated sustainability as the priority that balances ecological and social integrity with economic growth over solely chasing economic gains. By learning from Punta Cana's lessons, Pal Beach can manifest responsible development where economic vitality and ecological integrity flourish in constructive collaboration rather than conflict.

Overall, benchmarking against established beach tourism ecosystems informs pragmatic recommendations. Blending suitable management models with localized knowledge can optimize Pal Beach's development. Fostering community participation also assists governance in sustainably harnessing the social, economic, and environmental potential while addressing tangible challenges and facilitating responsible growth.

Moreover, by examining common sustainability challenges faced by places like Boracay and Punta Cana as they gained notoriety, Pal Beach can proactively implement measured growth and conservation to protect its social, economic, and environmental well-being rather than resort to restrictive interventions after the fact.

Summary and future research

In conclusion, Pal Beach demonstrates immense potential for development as a recreational beach tourism destination, evidenced by evaluations against critical success parameters. However, capitalizing on its potential sustainably requires mitigating existing risks and limitations through an integrated management approach, stakeholder collaboration and environmental conservation, informed by comparisons with thriving global beach tourism models.

While this study offers meaningful findings, insights can be enriched by assessing post-occupancy sustainability after tourism establishment, conducting a cost benefit analysis of proposed interventions, and through demographic and perception surveys of tourist preferences and expectations. Exploring these future research directions will further strengthen the knowledge basis for efficiently maximizing local community livelihoods while upholding the ecological and social integrity of Pal Beach.

Conclusion

This assessment of Pal Beach reveals its exceptional potential as a beach tourism destination based on an analysis of ten critical parameters. The findings highlight several advantages, including shallow waters conducive to secured recreation, sandy shores with innate buffering capacity, and sufficient width to host amenities without congestion. Additionally, the gentle slopes facilitate accessibility for visitors with mobility constraints. Lush beach vegetation and remarkably clear waters add to the idyllic setting.

However, realizing the area's immense tourism potential requires actively addressing limitations posed by strong currents, harmful marine species risks and inadequate freshwater availability onsite through integrated management plans that balance safety, ecological conservation and sustainability while optimizing visitor experience.

The research holds broader implications for coastal tourism development policies in Indonesia and globally. As the tourism landscape evolves amidst declining water resources and climate challenges, Pal Beach offers a blueprint for leveraging economic opportunities without compromising ecological integrity. The use of sustainability indicators and evidence-based assessments of tourism viability applied in this study can guide decisions on regional developments.

To conclude, while Pal Beach possesses tremendous potential for beach tourism, capitalizing on its immense potential warrants mitigating current pitfalls. This existing condition demands an intersectional approach considering environmental, social, and economic perspectives. The solutions should blend innovation, localized knowledge, and global best practices for holistic, resilient, and responsible tourism growth. Beyond Pal Beach, the framework and findings contribute to scholarly discussion on sustainable coastal destination management.

Acknowledgement

The authors would like to express their sincere gratitude to Politeknik Negeri Manado in North Sulawesi, Indonesia, for providing the financial support that made this research possible. We are deeply appreciative of our colleagues who contributed to the data collection process, enabling us to perform a comprehensive and rigorous analysis. Their invaluable contributions were essential to the successful completion of this study. The authors take full responsibility for the work, including the text, content, interpretations, opinions, and conclusions presented in this manuscript. Furthermore, the authors declare that there are no conflicts of interest associated with this research.

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