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Oil Palm Tourism as a Strategy for Sustainability and Positive Engagement: A Preliminary Case Study for SD Guthrie EcoGardens

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Abstract

The oil palm industry, crucial to tropical nations like Malaysia, frequently faces environmental criticisms that impact its global reputation. Negative perceptions often stem from misinformation and limited firsthand exposure, leading to misconceptions about its sustainability efforts. This exploratory pilot study examines the potential of oil palm tourism as a strategy to address these concerns by fostering direct engagement and education. A preliminary case study was conducted at SD Guthrie EcoGardens (SDGE) in June 2023, involving on-site surveys with 15 visitors (aged 21–23) to assess perceptions of oil palm's environmental sustainability, socio-economic impact, community involvement, cultural preservation, educational value, and infrastructure sustainability. Using a 5-point Likert scale (1 = Very Poor to 5 = Excellent), the overall evaluation score was 4.3, with infrastructure sustainability (4.5) rated highest, followed by environmental sustainability and cultural preservation (4.4), educational impact (4.3), socio-economic contributions (4.2), and community involvement (4.0) as the lowest-rated aspect. Findings highlight oil palm tourism's potential as a strategic investment to enhance public perception, stimulate economic benefits, and improve industry transparency. However, as this is a preliminary case study with a limited sample size, further large-scale research is necessary to validate these findings and examine the long-term impact of oil palm tourism. Wider adoption of oil palm tourism, supported by increased funding for community engagement, cultural integration, and infrastructure development, could strengthen global support for the industry and establish oil palm tourism as a high-value eco-tourism and sustainability initiative

1. Introduction

The oil palm industry is a cornerstone of the global vegetable oil supply chain and has been a central driver of Malaysia's socio-economic transformation for more than a century. Since the establishment of the first commercial oil palm plantation at Tennamaram Estate in 1917 [1], the industry has expanded rapidly in scale, complexity, and strategic importance. Malaysia's oil palm cultivation area increased from approximately 55,000 hectares in 1960 to about 5.61 million hectares by 2024, with private and government estates accounting for 73.6% of planted areas, followed by independent smallholders (14.6%) and organized smallholders (11.5%) [2]. Beyond land use expansion, the sector plays a critical role in employment generation, rural livelihood development, and national food security, positioning palm oil as both an economic commodity and a development instrument [3].

At the global level, oil palm cultivation aligns with multiple Sustainable Development Goals (SDGs), including poverty alleviation and employment creation (SDG1, SDG8, SDG10), food security enhancement (SDG2), industrial innovation and infrastructure development (SDG9), and responsible production systems (SDG12) [4]. Malaysia and Indonesia together contribute nearly 90% of global palm oil production, supplying key markets such as India, China, and the European Union [5][6]. Market data further reinforce palm oil's dominance: as of March 7, 2025, palm oil was traded at USD 1,013.26 per ton, substantially exceeding soybean oil (USD 227.65) and canola oil (USD 139.05), reflecting its superior yield efficiency, versatility, and sustained global demand [7].

Despite these contributions, the oil palm industry remains one of the most contested agricultural sectors globally. Persistent criticisms particularly in Western discourse have centered on deforestation, biodiversity loss, greenhouse gas emissions, and health concerns related to saturated fats [8][9]. These narratives are not solely environmental in nature but are also shaped by historical trade rivalries and geopolitical interests. Notably, the American Soybean Association (ASA) launched a coordinated campaign in the 1980s that framed palm oil as environmentally destructive and unhealthy, contributing to long-lasting misinformation in consumer markets [10]. More recently, regulatory interventions such as the European Union's Renewable Energy Directive II classified palm oil-based biofuels as high-risk indirect land-use change (ILUC) commodities, effectively phasing them out from EU renewable energy targets by 2030 [11][12].

In response to mounting external pressure and reputational challenges, Malaysia has implemented multiple awareness campaigns to reposition palm oil as a sustainable and socially responsible commodity. Initiatives such as the "Love MY Palm Oil" campaign launched in 2019 [13] and the "Palm Oil is God's Gift" campaign in 2020 sought to emphasize palm oil's role in food security, rural development, and sustainable agriculture [14]. However, despite their broad outreach, these campaigns have achieved limited success in reshaping entrenched perceptions, particularly among international audiences. This limitation underscores a fundamental challenge: perception-based conflicts cannot be effectively addressed through messaging alone, but require experiential, transparent, and evidence-based engagement.

Within this context, oil palm tourism has emerged as a potentially transformative strategy for addressing misinformation, enhancing transparency, and fostering constructive dialogue between producers and the public. As a specialized form of agro-tourism, oil palm tourism integrates experiential learning with sustainability education, allowing visitors to directly observe plantation operations, environmental management practices, and community engagement initiatives [15]. Unlike conventional tourism models that prioritize recreation, oil palm tourism is inherently educational, emphasizing conservation, governance, and socio-ecological responsibility as core components of the visitor experience [16].

Through guided tours, hands-on demonstrations, and structured sustainability narratives, oil palm tourism enables visitors to engage with the full lifecycle of palm oil production from cultivation and harvesting to processing and waste valorisation. Sustainability demonstrations, including environmentally friendly pest management using barn owls, buffer zone reforestation, high conservation value (HCV) area protection, and circular economy practices, provide tangible evidence of the industry's evolving sustainability commitments [17]. Cultural and heritage components further enrich the tourism experience by highlighting the historical role of plantations, Indigenous knowledge systems, and community participation in the sector's development. Complementary eco-tourism activities, such as guided biodiversity walks and conservation workshops, allow visitors to observe how managed oil palm landscapes can coexist with ecological protection objectives [18].

Importantly, oil palm tourism functions as a mechanism for bridging the knowledge gap that underpins many negative perceptions of the industry. Much of the criticism directed at palm oil is rooted in generalized narratives and outdated information, often disconnected from current sustainability practices and certification frameworks. By facilitating direct exposure, oil palm tourism enables visitors to critically reassess these assumptions, gaining insight into responsible land-use planning, certification requirements under the Roundtable on Sustainable Palm Oil (RSPO) and Malaysian Sustainable Palm Oil (MSPO), and ongoing improvements in environmental governance [19]. Increased transparency through public engagement has been shown to enhance trust, counter misinformation, and support more balanced discourse on contested agricultural systems [20].

Against this backdrop, SD Guthrie Plantation's establishment of SD Guthrie EcoGardens (SDGE) in 2020 formerly known as Sime Darby Plantation EcoGardens, represents a landmark initiative in Malaysia's oil palm

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sector. As the country's first structured oil palm tourism site, SDGE was designed to integrate sustainability education, biodiversity conservation, and experiential tourism within an operational plantation setting. Through guided plantation tours, conservation showcases, and interactive learning modules, SDGE demonstrates how oil palm tourism can be operationalized as a strategic engagement platform rather than a peripheral public relations tool [21]. As such, SDGE provides a valuable case study for examining the role of structured agro-tourism in reshaping public perceptions, generating socio-economic value, and reinforcing national sustainability commitments.

This preliminary study evaluates visitor perceptions of oil palm tourism at SDGE and assesses its potential effectiveness in enhancing transparency and sustainability awareness within the industry. By examining on-site visitor experiences, the study seeks to understand how direct engagement with oil palm landscapes influences attitudes toward environmental sustainability, socio-economic contributions, cultural integration, and governance practices. As an initial assessment based on a limited sample, the findings offer exploratory insights that lay the groundwork for future large-scale investigations into the long-term role of oil palm tourism as a strategic sustainability and public engagement instrument.

2. Research Methodology

This study was conducted at SD Guthrie EcoGardens (SDGE), located on Carey Island, Selangor, Malaysia (Figure 1). SDGE is a subsidiary of SD Guthrie Plantation Berhad, a prominent Malaysian-based oil palm plantation company known for its commitment to sustainable agriculture. SDGE officially commenced operations on January 1, 2020, positioning itself as the first comprehensive oil palm tourism initiative in Malaysia. This eco-tourism site integrates sustainability, education, and cultural heritage, offering visitors immersive experience in sustainable oil palm practices, conservation efforts, and community engagement (Figure 2). The selection of SDGE as the study site was based on its role as a model for oil palm eco-tourism, where visitors can gain firsthand exposure to industry sustainability efforts, biodiversity conservation, and socio-economic contributions. Additionally, Carey Island is home to the Mah Meri Indigenous community, further enriching the cultural and tourism potential of the region [22].

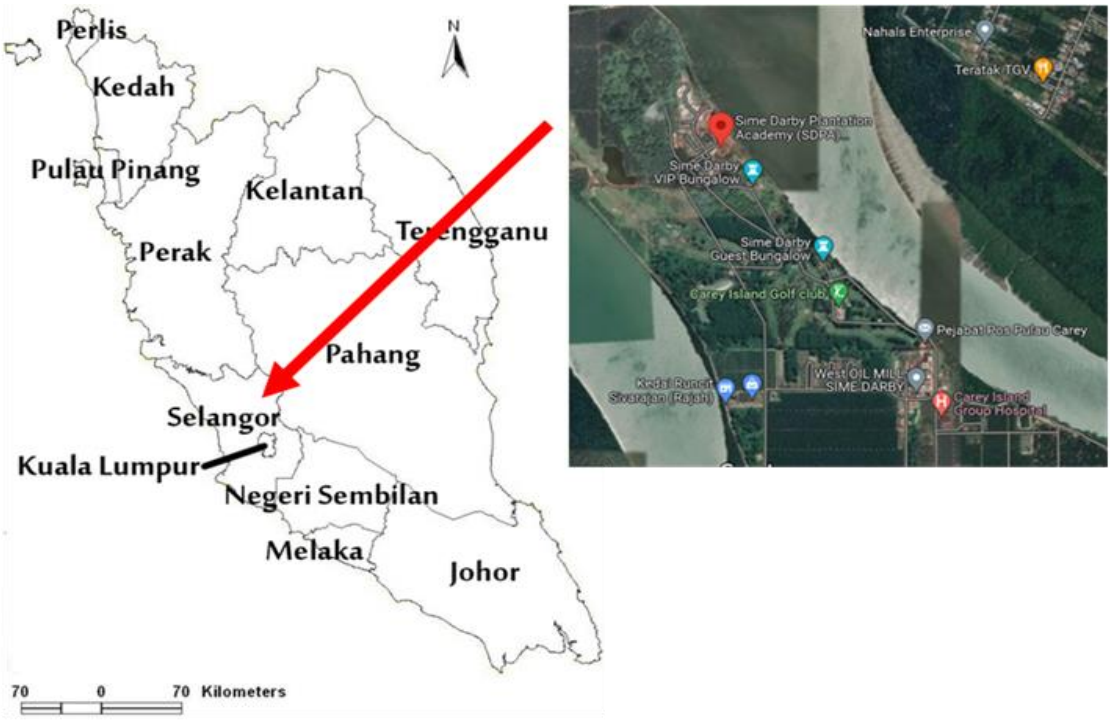

Fig. 1 *Location of SD Guthrie EcoGardens (SDGE) on Carey Island, Selangor, Malaysia. The left map highlights Selangor's location within Peninsular Malaysia*

Fig. 2 *Key highlights from the site visit to SD Guthrie EcoGardens (SDGE), Carey Island. The images showcase SDGE's facilities, historical buildings, and sustainability-focused visitor engagement activities*

2.1 Visitor Perception

A structured questionnaire was administered via Google Forms to evaluate visitor perceptions of SD Guthrie EcoGardens (SDGE). This pilot study involved 15 first-time visitors, aged between 21 and 23 years, who participated in the SDGE Oil Palm Tourism Experience. Data collection was conducted from 6 to 7 June 2023 during the on-site visit.

As this was a pilot study, no baseline or pre-visit questionnaire was conducted. Therefore, the findings represent visitors' post-visit perceptions based on their direct experience at SDGE. The questionnaire was administered immediately after the site visit to capture participants' real-time reflections on oil palm's environmental sustainability, socio-economic impact, community involvement, cultural preservation, educational value, and infrastructure sustainability.

The questionnaire used a 5-point Likert scale, where 1 = Very Poor, 2 = Poor, 3 = Average, 4 = Good, and 5 = Excellent. Visitor perceptions were measured across six key dimensions: environmental sustainability, socio-economic impact, community involvement, cultural preservation, educational value, and infrastructure sustainability. In addition to the structured responses, participants were also encouraged to share their immediate verbal reflections during the on-site visit. This approach allowed the study to capture both quantitative perception scores and qualitative impressions, thereby enhancing the depth of the pilot data collected.

2.2 Data Analysis

Descriptive statistics were employed to analyze visitor perceptions of SD Guthrie EcoGardens (SDGE), focusing on key aspects such as environmental sustainability, socio-economic impact, community involvement, cultural preservation, educational value, and infrastructure sustainability. The survey was conducted among 15 students (aged 21–23), enrolled in a tourism economics course, as they represent a demographic with limited exposure to the oil palm industry and generally negative perceptions toward it. The study aimed to assess whether direct engagement with oil palm tourism could shift their views.

Participants rated their experiences using a 5-point Likert scale (1 = Very Poor, 2 = Poor, 3 = Average, 4 = Good, 5 = Excellent). The overall experience score was calculated using a weighted average formula to assess the perceived effectiveness of SDGE in promoting oil palm tourism as an educational and sustainability-driven initiative, based on the following formula:

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$$Overall\ Experience\ Score = \frac{\Sigma(F_i \times S_i)}{N} \quad (1)$$

Where:

F_i = Frequency of responses for each rating option (1-5)
S_i = Score assigned to each rating (1, 2, 3, 4, or 5)
N = Total number of respondents (15)

3. Result and Discussion

Survey results indicate that SDGE received an overall rating of 4.3 across all assessed aspects, reflecting a generally positive visitor perception of its sustainability and tourism initiatives (Table 1). Infrastructure sustainability received the highest rating (4.5), highlighting strong visitors' satisfaction with site amenities and the overall tourism experience. The preservation of local cultural heritage and environmental sustainability both scored 4.4, demonstrating recognition of SDGE's commitment to cultural identity and conservation efforts. Educational programs on oil palm sustainability were rated at 4.3, affirming their role in enhancing public awareness. Socioeconomic contribution received a rating of 4.2, indicating that while visitors acknowledged its efforts, there is potential for further improvement. The lowest-rated category, SDGE's community involvement (4.0), suggests a need to strengthen local and indigenous community involvement in its tourism model.

A key factor influencing visitor perceptions was firsthand experience, which often differed from initial assumptions. Many visitors expected oil palm plantations to resemble monoculture landscapes with minimal biodiversity and negative environmental impacts. Prior studies have reinforced this view, associating oil palm with soil erosion, flooding, and declining water quality [16]. In contrast, rapeseed (canola) fields are often perceived as aesthetically pleasing and valued for agritourism [23]. The absence of such visual appeal in typical oil palm plantations has contributed to negative perceptions [24][25]. However, observations at SDGE challenged these assumptions. Unlike typical plantations, SDGE integrates conservation-focused land-use planning, particularly through the inclusion of flowering plants in buffer zones. This approach enhances biodiversity while improving aesthetic appeal [26]. Landscape perception is shaped by color, form, and environmental interactions [27], suggesting that strategic plantation design can enhance public perception. While oil palm lacks the vibrant flowering landscapes of rapeseed, incorporating floristic diversity supports pollinators, provides habitat for natural pest predators, and reduces chemical pesticide reliance [28]. Prior research shows that integrating beneficial plants, such as *Cassia cobanensis,* significantly reduces bagworm infestations [29][30]. Beyond ecological benefits, such species improve visual appeal, enhancing the potential of oil palm plantations as eco-tourism destinations [31][32].

Oil palm provides ecological advantages over other oilseed crops, including long-term carbon storage, mitigating climate change more effectively than annual crops like rapeseed [33]. However, younger plantations are associated with increased surface temperatures and sedimentation due to land clearing. Strategic landscape planning, such as buffer zones and vegetative integration, can mitigate these effects while improving biodiversity and landscape appeal [16][34].

Beyond environmental factors, SDGE fosters social inclusivity and cultural preservation. Visitors observed key infrastructure, including a clinic, mosque, Hindu and Chinese temples, reinforcing the role of plantations as integrated communities. Unlike perceptions of plantations as labor-intensive work zones with minimal benefits, structured settlements within oil palm estates provide stable housing, healthcare, and education. This model, evident in SDGE, is also reflected in Malaysia's FELDA, FELCRA, and KEJORA schemes, which offer essential services to plantation workers and smallholders. These initiatives promote workforce continuity and socio-economic stability, with retrenchment being rare compared to other industries due to consistent global palm oil demand [19].

SDGE's contribution to the local economy through sustainable tourism was rated 4.0, the lowest among evaluated categories, highlighting an area for improvement. Visitors expected greater community involvement, particularly engagement with the Mah Meri Indigenous community of Pulau Carey, known for its rich cultural heritage, including intricate wood carvings and traditional dances [22]. Integrating Indigenous culture into SDGE's tourism model could enhance visitor engagement and create new economic opportunities.

SDGE received a rating of 4.4 for promoting and preserving local cultural heritage. The Carey Island Museum documents the historical development of the plantation industry, including the island's establishment in 1905 by Edward Valentine John Carey. The museum provides historical insights into the oil palm industry's evolution and socio-economic impact. Additionally, SDGE maintains the Heritage Bungalows, officially designated under the National Heritage Designation 2019[17]. These European-style accommodations preserve estate-planning characteristics of early plantations. The Heritage Bungalows are identified as key visitor attractions, enhancing cultural appreciation. Their preservation aligns with SDGE's commitment to heritage conservation within sustainable tourism, reinforcing Malaysia's plantation history.

SDGE's educational programs on oil palm sustainability received a rating of 4.3, highlighting strong visitor engagement. The Palm Oil Experience Centre (POEC) serves as the core knowledge hub, providing structured learning experiences on the entire oil palm value chain. Visitors observindicators andemonstrations, learned about ripeness indicators, and studied sustainable pest control using barn owls. The processing section showcased different palm oil types, offering visitors hands-on exposure to its applications in food and non-food industries. By witnessing eco-friendly management strategies and the efficiency of production processes, visitors develop a more informed and balanced perspective on the role of oil palm in global sustainability efforts. This experiential approach helps bridge the gap between industry practices and public perceptions, contributing to a more positive and evidence-based understanding of the industry [35].

The highest-rated category, infrastructure sustainability (4.5), reflects strong visitor satisfaction with SDGE's facilities. The well-maintained site, combined with informative exhibits, enhanced the overall visitor experience, reinforcing the role of oil palm tourism as an effective educational and sustainability-driven initiative.

Table 1 *Visitor perceptions of sustainability practices at SD Guthrie EcoGardens (SDGE) based on a 5-point Likert scale (1 = Very Poor, 2 = Poor, 3 = Average, 4 = Good, 5 = Excellent)*

Survey	Rating Scale	Frequency	Percentage	Average Score
Environmental Sustainability	1	0	0%	
How would you rate SD Guthrie EcoGardens' (SDGE) efforts in promoting environmental sustainability through its conservation initiatives?	2	0	0%	4.4
	3	0	0%	
	4	9	60%	
	5	6	40%	
Socioeconomic Contribution	1	0	0%	4.2
How effectively does SDGE engage with and provide benefits to its workers and plantation staff?	2	0	0%	
	3	2	13.3%	
	4	8	53.3%	
	5	5	33.3%	
Community Involvement	1	0	0%	4.0
To what extent does SDGE contribute to the local economy through sustainable oil palm tourism, particularly in supporting local and Indigenous community involvement?	2	0	0%	
	3	3	20%	
	4	9	60%	
	5	3	20%	
Cultural Preservation	1	0	0%	4.4
Does SDGE actively promote and preserve local cultural heritage within its oil palm tourism experience?	2	0	0%	
	3	0	0%	
	4	6	40%	
	5	9	60%	
Educational Impact	1	0	0%	4.3
How effective are SDGE's educational programs in enhancing public understanding of oil palm sustainability?	2	0	0%	
	3	2	13.3%	
	4	7	46.7%	
	5	6	40%	
Infrastructure Sustainability	1	0	0%	4.5
How would you assess the sustainability of SDGE's infrastructure, facilities, and overall oil palm tourism model?	2	0	0%	
	3	0	0%	
	4	8	53.3%	
	5	7	46.7%	
OVERALL EVALUATION SCORE				**4.3**

4. Conclusion

This pilot study suggests that oil palm tourism has potential as an educational and experiential platform for improving public understanding of the oil palm sector. Based on post-visit responses from 15 first-time visitors, SD Guthrie EcoGardens (SDGE) received an overall evaluation score of 4.3, indicating generally positive visitor perceptions of the tourism experience. The highest-rated dimensions were infrastructure sustainability (4.5), cultural preservation (4.4), and environmental conservation efforts (4.4), while educational programmes (4.3) and community engagement (4.2) were also positively perceived. The contribution to the local economy received the lowest score (4.0), suggesting that future oil palm tourism initiatives could further strengthen the involvement of local and Indigenous communities in tourism-related activities.

The findings suggest that SDGE may serve as a useful platform for communicating sustainability practices, cultural values, and conservation efforts within the oil palm landscape. However, as this study was conducted as a small-scale pilot study and did not include a baseline or pre-visit questionnaire, the results should be interpreted as post-visit visitor perceptions rather than evidence of changes in public perception. Therefore, the findings cannot conclusively determine whether the visit changed participants' prior views on the oil palm industry.

Future research should include a larger and more diverse sample of visitors, as well as both pre-visit and post-visit questionnaires to assess changes in knowledge, attitudes, and perceptions more accurately. Follow-up studies could also evaluate whether visitor perceptions are sustained over time after the tourism experience. In addition, future oil palm tourism development should consider stronger community participation, structured educational content, and clearer socio-economic benefit-sharing mechanisms to enhance the long-term value of such initiatives. Overall, SDGE provides an early example of how oil palm tourism may contribute to sustainability communication, public education, and agro-tourism development in Malaysia, although further empirical evidence is needed to support broader replication across the industry.

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Conflict of Interest

Authors declare that there is no conflict of interests regarding the publication of the paper.

Author Contribution

The authors confirm their contributions to this study as follows: ***conceptualization and study design****, Noraini Ruslan;* ***supervision and overall research guidance****, Noraini Ruslan;* ***data collection****, Muhammad Haqim Mohamad Zakariah;* ***data analysis and interpretation of results****, Muhammad Haqim Mohamad Zakariah, Muhammad Azraie Bin Abdul Kadir, and Muhammad Fakri Bin Othman;* ***draft manuscript preparation****, Muhammad Haqim Mohamad Zakariah and Noraini Ruslan;* ***review and editing****, Noraini Ruslan and Ezzaruddin Abdul Rapar. All authors reviewed the results and approved the final version of the manuscript.*

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