



Exploring Sustainable Behaviors in Thailand's Green Marathon Through Advanced Modeling

Karun Kidrakarn¹, Jakkawat Laphet^{2*}, Pirapim Tangprom², Supanee Suanin³

¹ Mahasarakham Business School, Mahasarakham University, Mahasarakham 44150, Thailand

² College of Aviation Tourism and Hospitality, Sripatum University, Khon Kaen 40000, Thailand

³ Faculty of Logistics, Burapha University, Chonburi 20131, Thailand

Corresponding Author Email: Jakkawat.la@spu.ac.th

Copyright: ©2025 The authors. This article is published by IIETA and is licensed under the CC BY 4.0 license (<http://creativecommons.org/licenses/by/4.0/>).

<https://doi.org/10.18280/ijstdp.200919>

ABSTRACT

Received: 30 July 2025

Revised: 18 September 2025

Accepted: 19 September 2025

Available online: 30 September 2025

Keywords:

environment conservation, green marathon, experiential, exploring, sport tourism, Thailand

Sustainable behavioural in sport tourism is increasingly shaped by environmental awareness and intrinsic motivation. Understanding how these factors drive participation and spending in eco-friendly events, such as green marathons in Thailand, is essential. This study examines the relationships among Environment Awareness (EA), Self-Determination (SD), Behavioural Intention (BI), Perceived Quality (PQ), and Green Marathon Spending (GMS) to identify key drivers of sustainable engagement. Data were collected from 400 repeat participants using a structured survey. Partial Least Squares Structural Equation Modeling (PLS-SEM) evaluated the measurement and structural models, with fit indices (RMSEA, SRMR, CFI, TLI) and reliability/validity checks (CR, α , AVE, discriminant validity). The model fit was excellent (RMSEA = 0.028; SRMR = 0.060; CFI = 0.904; TLI = 0.906). EA significantly influenced SD ($\beta = 0.020$), BI ($\beta = 0.043$), PQ ($\beta = 0.064$), and GMS ($\beta = 0.055$). SD positively affected BI ($\beta = 0.044$) and PQ ($\beta = 0.071$), while PQ strongly predicted GMS ($\beta = 0.064$). Mediation analyses confirmed that SD and PQ mediated the effects of EA on spending, emphasizing PQ as the key determinant. EA and intrinsic motivation enhance perceived event quality, which drives eco-friendly spending. Integrating education and high-quality event design is vital to promote sustainable sport tourism engagement.

1. INTRODUCTION

In recent years, sports events have evolved beyond recreation into platforms that drive economic growth, cultural diplomacy, and public health promotion [1, 2]. Global spectacles such as the Olympic Games and FIFA World Cup demonstrate their power to attract tourism, stimulate infrastructure development, and reinforce national identity [3, 4]. These mega-events also highlight the dual role of sports in fostering healthy lifestyles while stimulating local economies through hospitality, transportation, and merchandising industries [5, 6].

Thailand reflected this momentum through the growing popularity of endurance events such as the Buriram, Laguna Phuket, and Khon Kaen Marathons [7]. With supportive infrastructure, government backing, and community enthusiasm, the country has positioned itself as a regional hub for mass-participation sports [8, 9]. Running in particular, has become deeply embedded in Thai culture as both a health-promotion activity and a form of community identity. However, these events also generate significant environmental impacts, including waste, energy use, and ecosystem disruption [10]. Left unaddressed, these impacts may undermine the long-term viability and social license of such events.

In response, the “green marathon” model has emerged to integrate eco-friendly logistics, waste reduction, and community engagement [11]. This approach aligns closely with Thai cultural values of mindfulness, respect for nature, and collective responsibility, linking environmental stewardship with national identity [12, 13]. The Khon Kaen International Marathon illustrates this model by combining multiple race categories with cultural celebration and sustainability initiatives, enhancing both participant experience and community pride [14, 15]. By doing so, it demonstrates how sustainability can be embedded not only in event management but also in athletes’ experiences, shaping behaviour before, during, and after the event.

Despite the growing adoption of sustainability practices in global and regional sporting events, research has largely emphasized event management and operational strategies rather than the psychological and cultural drivers of athlete behaviour [16, 17]. Recent studies have examined carbon reduction, green logistics, and eco-certifications, yet there is limited empirical evidence on how participants’ environmental awareness (EA), intrinsic motivation, and perceived event quality shape their willingness to support green initiatives financially. Little is known about how these factors translate into eco-friendly spending intentions in Thailand’s marathon context [18], where cultural norms of

collectivism and harmony with nature may play a unique role. This absence of athlete-focused, culture-sensitive analysis created a critical knowledge gap in the literature [19-21].

Against this backdrop, the present study investigates how EA, intrinsic motivation, perceived event quality, and spending behaviour interact in Thailand's green marathons. By applying advanced modeling techniques, this research addresses the gap in understanding how cultural and psychological factors jointly influence sustainable participation. The findings aim to inform policymakers and organizers on designing environmentally responsible, culturally resonant sports tourism initiatives that both sustain the growth of Thailand's marathon culture and advance the United Nations Sustainable Development Goals (SDGs).

2. LITERATURE REVIEW

2.1 Environmental awareness (EA)

EA plays a critical role in shaping sustainable behaviour in the context of mass sporting events. It involves individuals' understanding of environmental issues and their willingness to engage in practices that reduce ecological impact [22, 23]. In green marathons, awareness can manifest through support for waste reduction, resource conservation, and eco-education efforts [24].

In Thailand, EA is deeply embedded in cultural and religious values particularly Buddhism, which emphasises mindfulness, harmony with nature, and social responsibility [25]. These cultural dimensions foster eco-friendly behaviours among Thai marathon participants, such as using reusable water bottles and participating in environmental campaigns during events [26].

EA does not function in isolation; it influences multiple psychological and Behavioural outcomes [27]. First, it promotes self-determined motivation by aligning personal and cultural values with environmental goals (H1). Secondly, it influences participants' intentions to act in environmentally responsible ways, such as choosing green-certified marathons (H2). Third, awareness of environmental initiatives within an event can enhance its perceived quality (PQ), as participants interpret these efforts as indicators of responsible and meaningful event management (H3). Lastly, awareness can directly influence GREEN MARATHON Spending (GMS), as environmentally conscious individuals may be more inclined to financially support eco-friendly initiatives (H6).

H1: EA has a statistically significant relationship with Self-Determination (SD).

H2: EA has a statistically significant relationship with Behavioural Intention (BI).

H3: EA has a statistically significant relationship with PQ.

H6: EA has a statistically significant relationship with GMS.

2.2 Self-determination theory (SD)

Self-determination theory (SDT) explains how intrinsic motivation is cultivated through the satisfaction of three fundamental psychological needs: autonomy, competence, and relatedness. In the context of green marathons, participants who feel they are contributing to environmental causes autonomously (autonomy), feel capable of making an impact (competence), and feel a sense of shared purpose with others (relatedness) are more likely to internalise eco-friendly

behaviours [28].

SD plays a mediating and predictive role in several Behavioural outcomes [29]. First, individuals with high self-determined motivation are more likely to form BIs aligned with environmental sustainability [30], such as attending or promoting green marathons (H4). Secondly, such individuals tend to evaluate events more positively, leading to higher PQ of the marathon experience (H5). Lastly, intrinsically motivated participants are also more likely to spend on green events as a form of value-driven consumption (H7).

H4: SD has a statistically significant relationship with BI.

H5: SD has a statistically significant relationship with PQ.

H7: SD has a statistically significant relationship with GMS.

2.3 Behavioural intention (BI)

BI refers to an individual's readiness to engage in a particular behaviour. In the context of green marathons, this includes intentions to participate in, support, or promote events that are environmentally responsible. Research shows that BIs are a strong predictor of actual behaviour and spending in tourism and sporting contexts [29, 30].

Participants who are environmentally aware and self-motivated are more likely to form strong intentions to support sustainable events. These intentions, in turn, influence actual behaviour, including spending on green marathon experiences, such as purchasing eco-friendly merchandise, paying higher registration fees for sustainable events, or donating to environmental causes.

H8: BI has a statistically significant relationship with GMS.

2.4 Perceived quality (PQ)

PQ refers to the subjective evaluation of the overall excellence of an event. In green marathons, this includes judgements about sustainability practices, cultural alignment, organization, and participant experience. High PQ leads to increased participant satisfaction, loyalty, and spending behaviour [30].

Participants' perceptions of quality are influenced by both EA and SD, as these factors shape how they interpret and evaluate the event's environmental performance [31]. In turn, higher PQ contributes to higher spending, as satisfied participants are more likely to invest in experiences and merchandise aligned with their values [32].

H9: PQ has a statistically significant relationship with GMS.

Figure 1 indicates the conceptual research framework.

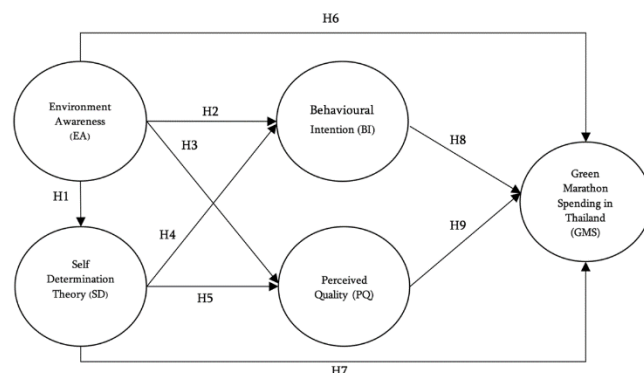


Figure 1. Conceptual research framework

This study employed a quantitative, correlational research design to investigate the relationships between EA, SD, PQ, BI, and spending behavioural in the context of green marathons in Thailand. The target population comprised approximately 9,000 marathon finishers from the Khon Kaen International Marathon, covering all race categories including Mini (11.55 km), Half (21.1 km), and Full Marathon (42.195 km).

Given the practical limitations of reaching runners immediately after the race, a stratified convenience sampling method was used. Participants were stratified by gender, age group, and race category to ensure diversity while maintaining accessibility. A total of 400 complete responses were obtained. Although a 100% response rate is uncommon in online surveys, it was achieved by distributing the Google Forms link only to runners who had provided prior consent, either directly at the finish line or through official marathon social-media channels such as LINE and Facebook.

The structured questionnaire was divided into six sections, measuring key constructs using items developed from validated sources and assessed on a 5-point Likert scale. Each construct included three observed variables: EA (e.g., “I consider environmental awareness important when participating in running events”), SD (e.g., “I feel accomplished when taking part in environmentally responsible runs”), PQ (e.g., “The green marathon is well-organized, with clear emphasis on sustainability”), BI (e.g., “I intend to encourage friends and family to join eco-friendly marathons”), and GMS (e.g., “I am willing to pay a higher fee to join eco-friendly running events”). The instrument was validated by three experts in environmental education, sports science, and tourism management, achieving Index of Item–Objective Congruence (IOC) scores above 0.70. A pilot test with 30 participants produced a Cronbach’s alpha of 0.870, confirming internal consistency.

To validate the measurement model, Confirmatory Factor Analysis (CFA) was conducted. The Composite Reliability (CR) values ranged from 0.878 to 0.914, all below the 0.95 threshold recommended [33], indicating strong reliability without redundancy. All constructs achieved Average Variance Extracted (AVE) values above 0.70, confirming convergent validity, while discriminant validity was verified using the Fornell-Larcker criterion [34]. Variance Inflation Factor (VIF) values for all items were below 3.3, ensuring no multicollinearity or collinearity concerns. To control for common method bias, both procedural and statistical remedies were applied. Anonymity was guaranteed, item order was randomized, and neutral wording was used to reduce social desirability bias. Additionally, Harman’s single-factor test revealed that no single factor accounted for the majority of the variance, further confirming that common method bias was not a major concern.

Data were analyzed using Structural Equation Modeling (SEM) to test the hypothesized paths between constructs. Model fit was assessed using indices such as the Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), and Root Mean Square Error of Approximation (RMSEA). Bootstrapping with 5,000 samples was applied to test the significance of path coefficients at a 95% confidence level ($p < 0.05$). The study was conducted in compliance with ethical research guidelines and received official approval from the Ethics Committee of Sripatum University, Khon Kaen Campus (Approval No.

4. RESULTS

Based on the data collected from 400 respondents, it was found that 400 individuals had participated in the green marathon more than once, representing the target population for this research. Overall, 100% of respondents reported having participated in the event multiple times, most of the sample was female, accounting for 50.7%, followed by males at 40.3%, and a small percentage (9.0%) identifying as other or having alternative gender identities. The most represented age group was 20-29 years old, comprising 65.2% of respondents, with the 30-39 age group following at 18.4%, and lower proportions for those aged 40-49 and 50-59. Regarding occupation, students made up the largest segment at 42.3%, with entrepreneurs and corporate employees as the next significant groups; self-employed individuals and civil servants represented smaller portions. In terms of income, the largest group earned less than 15,000 baht, constituting 34.5%, with the subsequent groups earning between 15,001-25,000 and 25,001-35,000 baht. Few respondents reported a salary exceeding 55,000 baht. Concerning participation frequency, most had attended the marathon twice, accounting for 65.8%, followed by those who participated 3-5 times at 40.1%, and a smaller group of over 5 times at 7.7%. Overall, the data indicate that most participants were young females, primarily students or entrepreneurs with lower income levels, and they tended to have multiple experiences participating in the green marathon.

Table 1. Summarizes the fit statistics of the measurement model

	df	RMSEA ^a	SRMR ^b	CFI ^c	TLI ^d
Final Measurement Model	2.890	0.028	0.060	0.904	0.906
The target of the criterion [35]	3	< 0.07	< 0.08	> 0.90	> 0.90

Note: Root mean square error approximation is RMSEA; standardized root mean squared is b SRMR; comparative fit index is c CFI; Tucker Lewis Index is d TLI.

The measurement model’s fit statistics are presented in Table 1, summarizing the model evaluation. The study examined tourists’ environmental perceptions, motivations, and BIs related to the green marathon, with the measurement model’s fit evaluated using several indices as shown in Table 1. The model demonstrated an excellent fit, with a RMSEA value of 0.028 and a Standardized Root Mean Square Residual (SRMR) of 0.060, both well below the recommended thresholds of 0.07 and 0.08, respectively. Additionally, the CFI and TLI were 0.904 and 0.906, respectively, surpassing the cutoff criterion of 0.90, indicating that the measurement model accurately represents the data structure. The degrees of freedom (df) were 2.890, slightly below the target criterion of 3, further supporting the model’s suitability. These fit indices collectively confirm the robustness of the measurement model in capturing the constructs under study. The assessment of the measurement model adhered to the guidelines proposed by Hair et al. [35].

The measurement model was thoroughly reviewed to ensure

its reliability and validity. As shown in Table 2, all factor loadings exceeded the recommended threshold of 0.70 [35], ranging from 0.794 to 0.907, which indicates strong item reliability. The t-values for all items were substantially higher than the critical value of 25, confirming the statistical significance of the factor loadings. Internal consistency was confirmed with CR values above 0.90 for all constructs, including Environment Awareness (CR = 0.913), Self-Determination Theory (CR = 0.907), Behavioural Intention (CR = 0.878), Green Marathon Perceived Quality (CR = 0.910), and GMS in Thailand (CR = 0.914). Cronbach's alpha values also surpassed the acceptable cutoff of 0.70, further supporting the reliability of the scales. AVE scores were all

above 0.65, specifically 0.778 for Environment Awareness (EA), 0.764 for SD, 0.705 for Behavioural Intention, 0.772 for PQ, and 0.858 for Spending Perspectives, indicating good convergent validity [36]. VIF values ranged between 1.512 and 2.610, well below the critical value of 5.0, suggesting no multicollinearity concerns. Discriminant validity was assessed using the Fornell–Larcker criterion, as shown in Table A1. The square roots of the AVE for each construct (ranging from 0.874 to 0.883) were greater than their highest correlations with other constructs, confirming clear discriminant validity among EA, SD, BI, PQ, and Spending Perspectives. This comprehensive validation supports the robustness of the measurement model for subsequent analyses.

Table 2. Measurement model results

Constructs	Measurement Label	VIF	Loading	T-Value
EA Mean =4.102; SD =0.732; CR=0.913; α = 0.857; AVE = 0.778;	EA1: I recognize how daily human activities affect the environment.	1.979	0.866	39.169
	EA2: I consider environmental awareness important when participating in running events.	2.156	0.873	52.900
	EA3: I actively engage in practices that protect and preserve nature.	2.444	0.907	75.339
SDT Mean =4.175; SD = 0.708; CR= 0.907; α = 0.861; AVE = 0.764	SD1: I join running events because I enjoy them and find them meaningful.	2.171	0.881	54.980
	SD2: I feel accomplished when taking part in environmentally responsible runs.	2.027	0.875	60.566
	SD3: I select running events that align with my personal health and ecological values.	1.930	0.866	53.345
BI Mean =4.088; SD = 0.745; CR= 0.878; α = 0.791; AVE = 0.705	BI1: I plan to consistently participate in running events that support environmental sustainability.	1.850	0.867	60.534
	BI2: I intend to encourage friends and family to join eco-friendly marathons.	1.760	0.857	55.027
	BI3: I aim to adopt and maintain environmentally responsible behaviours when preparing for and participating in runs.	1.512	0.794	25.273
PQ Mean =4.193; SD = 0.721; CR= 0.910; α = 0.852; AVE = 0.772	PQ1: The Green Marathon is well-organized, with clear emphasis on sustainability.	1.998	0.860	53.711
	PQ2: Materials and resources used in the event genuinely support environmental conservation.	2.022	0.870	48.723
	PQ3: The event effectively communicates ecological information, motivating participants to care for the environment.	2.555	0.905	84.902
GMS Mean =4.141; SD = 0.737; CR= .914; α = .779; AVE = 0.858	GMS1: I am willing to pay a higher fee to join eco-friendly running events.	2.610	0.909	73.935
	GMS2: I am willing to buy eco-conscious merchandise offered at the Green Marathon.	2.150	0.878	69.196
	GMS3: I intend to participate in future editions of the Green Marathon.	1.990	0.861	41.868

Note: CR = Composite Reliability; α = Cronbach's alpha; AVE = Average Variance Extracted; VIF = Variance Inflation Factor.

All factor loadings are significant at $p < 0.001$, confirming convergent validity.

Table 3. Path analyses (direct effects)

Direct Effect	Path	Std. β	T-Value	P-Value	Results
H1	EA→SD	0.020	40.059**	.000	Accepted
H2	EA→BI	0.043	47.001**	.000	Accepted
H3	EA→PQ	0.064	29.675**	.000	Accepted
H4	SD→BI	0.044	13.999**	.000	Accepted
H5	SD→PQ	0.071	6.761**	.000	Accepted
H6	EA→GMS	0.055	28.972**	.000	Accepted
H7	SD→GMS	0.092	1.923**	.055	Rejected
H8	BI→GMS	0.088	1.635**	.102	Rejected
H9	PQ→GMS	0.064	6.921**	.000	Accepted

Notes: *** $p < 0.01$; ** $p < 0.05$; n.s. = $p > 0.05$

Table 3 presents the direct-effect results of the structural model and shows that most hypothesised paths are statistically

significant, indicating strong support for the proposed framework. EA functions as the principal upstream driver: it exerts significant positive effects on SD, BI, PQ, and even directly on Green-Marathon Spending (GMS). Although the standardized coefficients are modest ($\beta = 0.02$ – 0.06), the exceptionally large t-values, for example, $t = 40.06$ for (EA→SD) suggest either very low residual variance or a potential underestimation of standard errors, which should be verified by re-running the bootstrap or examining the SEM output in detail. SD significantly predicts BI and PQ, confirming its role as a motivational mechanism, but its direct influence on GMS is not significant ($p = 0.055$), implying that SD affects spending primarily through indirect pathways, particularly via enhanced perceptions of event quality. Likewise, BI does not significantly predict GMS ($p = 0.102$), showing that intention alone is insufficient to drive eco-friendly purchases when other factors are controlled. In contrast, PQ emerges as the strongest direct determinant of green spending ($\beta = 0.064$, $t = 6.92$, $p < 0.001$), highlighting

the critical importance of participants’ evaluations of event quality in translating awareness and motivation into actual expenditure. Overall, these findings indicate that while EA lays the psychological groundwork for sustainable behaviour, PQ is the decisive factor that converts motivation and intention into tangible green-marathon spending.

Indirect effects

H9a: SD mediates the relationship between SD and GMS through PQ.

H9b: SD mediates the relationship between SD and GMS through BI.

H10a: EA indirectly influences GMS through BI.

H10b: EA) indirectly influences BI through SD.

H10c: EA indirectly influences GMS through SD.

H10d: EA indirectly influences GMS through PQ.

H10e: EA indirectly influences PQ through SD.

H12a: EA indirectly influences GMS through the sequential mediation of SD and BI.

H12b: EA indirectly influences GMS through the sequential mediation of SD and PQ. Show in Table 4.

Table 4. Path analyses (Indirect effects)

Direct Effect	Path	T-Value	P-Value	Results
H9a	SD→PQ→GMS	4.727**	0.000	Full mediated
H9b	SD→BI→GMS	1.595**	0.111	Partial mediation
H10a	EA→BI→GMS	1.588**	0.112	Partial mediation
H10b	EA→SD→BI	12.907**	0.000	Full mediated
H10c	EA→SD→GMS	1.901**	0.057	Partial mediation
H10d	EA→PQ→GMS	4.555**	0.000	Full mediated
H10e	EA→SD→PQ	6.664**	0.000	Full mediated
H12a	EA→SD→BI→GMS	1.600**	0.110	Partial mediation
H12b	EA→SD→PQ→GMS	4.730**	0.000	Full mediated

Notes : *** p < 0.01; ** p < 0.05; n.s. = p > 0.05

Table 4 presents the results of indirect effects in path analysis. For hypotheses H7a-b, the relationship between EA and both Green Mara-thon PQ and GMS is fully mediated by SDT. This is indicated by high t-values (10.334 and 5.317) and a significant p-value of .000. In hypotheses H8a-b, the relationship between EA, SD, and GMS is also fully mediated by PQ, with t-values of 4.056 and 7.352, and a p-value of .000. Finally, hypothesis H9 shows that the relationship between EA and GMS is fully mediated by both SD and PQ, with a t-value of 7.312 and a p-value of 0.000 Overall, all hypotheses are supported, indicating that the mediating variables (SD and PQ) play crucial roles in the indirect relationship between EA and GMS in Thailand.

Figure 2 illustrates the structural model based on the research hypotheses, highlighting the relationships among variables: EA, SD, PQ, and GMS.

The blue circles represent latent constructs with their respective CR scores (e.g., 0.775, 0.727, 0.800), indicating good internal consistency. The yellow boxes display the measurement items for each construct, with factor loadings showing the strength of each indicator. The arrows depict the

hypothesized paths: solid lines indicate direct effects, with the standardized path coefficients shown along the arrows, all of which are statistically significant given their t-values (not shown here). The model suggests that higher EA positively influences SD, which in turn enhances perceptions of quality, ultimately leading to increased GMS. Each path’s coefficient reflected the strength of the relationship, confirming the hypothesized associations within the framework. This visual facilitates understanding of how environmental cognition, motivation, perceived event quality, and BIs are interconnected in promoting eco-friendly behaviours related to green events in Thailand.

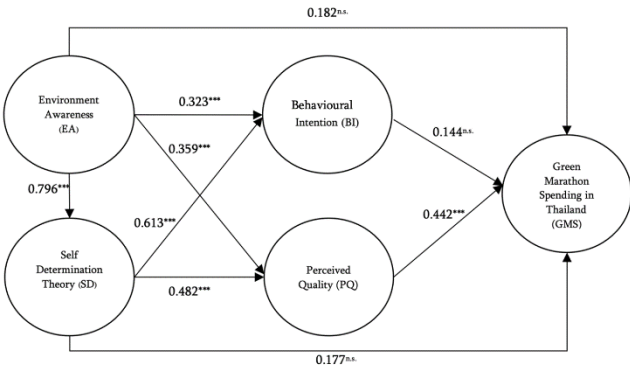


Figure 2. Results of PLS-SEM on exploring sustainable behaviours in Thailand’s green marathon through advanced modeling
*** p < 0.01; n.s. = p > 0.05

The structural model demonstrates that EA significantly influences SDT, which in turn positively affects both BI and PQ. While BI has a non-significant direct effect on GMS, PQ strongly and significantly impacts spending. Additionally, direct effects of EA and SD on spending are not statistically significant. These results highlight the crucial role of PQ in driving spending behavioural in green marathons, emphasizing that EA and intrinsic motivation primarily influence spending indirectly through perceived event quality.

5. DISCUSSION

The findings confirm that EA significantly enhances intrinsic motivation to engage in pro-environmental Behaviours during the green marathon, reinforcing the critical role of environmental education in shaping sustainable behavioural [37, 38]. This intrinsic motivation is essential in sport tourism contexts, where events like green marathons function not only as athletic challenges but also as platforms to promote sustainable tourism practices [39]. Participants with higher EA perceive the event as more credible and meaningful, fostering positive attitudes toward conservation and greater willingness to financially support eco-friendly initiatives [40]. This aligns with prior studies emphasizing sport tourism's potential as an effective vehicle for environmental education and awareness-raising [41, 42].

Interestingly, connectedness to nature did not significantly predict green spending behavioural, which may reflect the influence of cultural factors such as collectivism prevalent in Thai society. In collectivist cultures, group norms and social expectations often outweigh personal emotional bonds with nature, suggesting that community-oriented values may

moderate the impact of individual nature connectedness on spending decisions [43]. This interpretation expands on previous findings and highlights the importance of considering cultural context when examining environmental behavioural.

Comparing our results with earlier work on marathon consumer behavioural, such as Hsiao et al. [44], reveals consistent evidence that SD plays a key role in predicting eco-friendly spending. Our findings extend this by demonstrating that intrinsic motivation not only drives participation but also translates into greater financial support for sustainable event initiatives. This underscores the value of fostering autonomous motivation in sport tourism to enhance both behavioural engagement and economic contributions toward sustainability [45, 46].

This study has limitations. The cross-sectional design restricts causal inference, and the sample may suffer from self-selection bias since participants were repeat attendees likely already inclined toward environmental values. Moreover, the reliance on self-reported spending intentions rather than actual expenditure data could affect the accuracy of predicting real-world economic behavioural. Future research should consider longitudinal designs and incorporate objective spending measures to address these gaps [47].

Practically, event organizers should implement targeted sustainability initiatives informed by these insights. For example, installing refill stations at 2-kilometer intervals would reduce single-use plastic waste and encourage eco-conscious hydration. Offering discounts or incentives for participants using reusable cups and eco-friendly gear can further promote sustainable behavioural. Additionally, incorporating educational campaigns that emphasize intrinsic motivation, and cultural values may strengthen participants' engagement and financial support for green events [47]. These specific actions can enhance the PQ of eco-events and cultivate a deeper commitment to environmental responsibility among both local communities and tourists [48].

6. CONCLUSION

This study demonstrates that EA, intrinsic motivation (self-determination), perceived event quality, and cultural perspectives collectively influence eco-friendly participation and spending behavioural in Thailand's green marathon events. Increasing environmental knowledge significantly enhances intrinsic motivation, which positively shapes perceptions of event quality—both crucial factors in encouraging sustainable engagement in sport tourism. These psychological and perceptual drivers directly impact participants' attitudes and financial support for environmentally responsible practices, reinforcing behaviours aligned with sustainable tourism principles.

The findings highlight the importance of integrating educational efforts and quality improvements within sport tourism events, particularly in cultural contexts valuing community and ecological harmony. Practical applications include targeted awareness campaigns and specific sustainability measures such as hydration refill stations and incentives for using reusable items that can further promote green participation and eco-friendly spending.

Future research should consider longitudinal approaches, actual expenditure data, and the role of social influences across different cultural settings to deepen understanding of

sustainable behaviours in sport tourism. Overall, this study advances knowledge on how environmental cognition, motivation, culture, and tourism experiences combine to support sustainable sport tourism development.

7. POLICY RECOMMENDATION

Based on the study's findings, policymakers and event organizers should prioritize environmental education initiatives to enhance participants' awareness and intrinsic motivation towards sustainable behavioural. Integrating environmental messages and sustainability practices into sport tourism events like the green marathon can strengthen pro-environmental attitudes and increase eco-friendly spending. Practical policies may include establishing refill water stations at regular intervals to reduce plastic waste, offering discounts or incentives for participants who use reusable cups or eco-friendly merchandise, and promoting educational campaigns that highlight the environmental impact of sport tourism. Additionally, fostering collaborations between local communities, environmental groups, and tourism authorities can support cultural acceptance and long-term commitment to sustainable sport tourism. Such policies will not only improve the PQ of eco-friendly events but also align with broader SDGs.

8. LIMITATION AND FUTURE RESEARCH

This study has several limitations that should be acknowledged. First, the cross-sectional design restricts the ability to infer causal relationships or observe changes in behavioural over time. Second, the sample was limited to repeat participants in the green marathon, which may introduce self-selection bias and limit generalizability to broader tourist populations. Third, the reliance on self-reported intentions for eco-friendly spending may not accurately reflect actual expenditure behavioural. Future research should employ longitudinal designs to capture Behavioural changes and use objective measures of spending to validate intentions. Moreover, exploring the roles of social norms, cultural collectivism, and connectedness to nature in different cultural contexts could provide deeper insight into the motivational factors driving sustainable behavioural in sport tourism. Expanding studies to include diverse events and populations would enhance the understanding and applicability of sustainable sport tourism strategies globally.

AUTHOR CONTRIBUTIONS

Design research, K.K., J.L., P.T and S.S; methodology, K.K., P.T. and S.S; software, K.K. and J.L; validation, K.K. and J.L.; formal analysis, K.K. and J.L.; investigation, K.K. J.L., and S.S.; data curation, J.L; writing - original draft preparation, K.K. and J.L; writing - review and editing, K.K., J.L., and P.T.; Project administration, K.K. J.L., and S.S. Summarize results K.K., J.L., P.T., and S.S., Provide Recommendations P.T. and S.S., Funding K.K., All authors have read and agreed to the published version of the manuscript. And essentially intellectual contributor: S.S, P.T.

FUNDING

This research project was financially supported by Mahasarakham University.

REFERENCES

- [1] Kiani, M.S., Rizvandi, A. (2020). Investigating the impact of the media on international sporting events and the extent of tourist attraction at that event. *Journal of Humanities Insights*, 4(2): 45-51. <https://doi.org/10.22034/jhi.2020.107159>
- [2] Di Gioia, G., Ferrera, A., Celeski, M., Mistrulli, R., Lemme, E., Mango, F., Squeo, M.R., Pelliccia, A. (2024). Lipid accumulation product and cardiometabolic index as effective tools for the identification of athletes at risk for metabolic syndrome. *Life*, 14(11): 1452. <https://doi.org/10.3390/life14111452>
- [3] Custom Market Insights. (2024). Global sports competition market. <https://www.custommarketinsights.com/>
- [4] Dhiman, B. (2023). Unleashing the power of television broadcasting in the digital age: A critical review. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.4598192>
- [5] Fong, K. (2025). The power play: Assessing the impact of hosting global sporting events. *Open Journal of Political Science*, 15(2): 358-385. <https://doi.org/10.4236/ojps.2025.152020>
- [6] Lakhliifi, H., Boumaize, A. (2025). Morocco's tourism policy for the FIFA World Cup 2030: A benchmarking and econometric study. *International Journal of Research in Economics and Finance*, 2(2): 33-60. <https://doi.org/10.71420/ijref.v2i2.55>
- [7] Getz, D. (2024). Festival and event tourism. In *Encyclopedia of Tourism*. Springer Nature Switzerland, pp. 391-395. https://doi.org/10.1007/978-3-030-74923-1_84
- [8] Tanthavanich, W., Intana, A. (2021). The development of running event ontology for sport tourism in Thailand. 2021 36th International Technical Conference on Circuits/Systems, Computers and Communications (ITC-CSCC), Jeju, Korea. <https://doi.org/10.1109/itc-csc52171.2021.9501410>
- [9] Puangmanee, S., Saearlee, M. (2021). Management of solid waste from Phuket International Marathon running event. *International Journal of Environmental Impacts: Management, Mitigation and Recovery*, 4(3): 289-301. <https://doi.org/10.2495/ei-v4-n3-289-301>
- [10] Lubina, M. (2025). A political marathon with(out) happy ending. Poland's democratization and conclusions for Burma/Myanmar. In *Youth, Community, and Democracy in India, Myanmar, and Thailand*. Springer Nature Singapore, pp. 305-327. https://doi.org/10.1007/978-981-97-6378-8_12
- [11] Varea-Calero, A.D., Rejón-Guardia, F., Ramírez-Hurtado, J.M., Berbel-Pineda, J.M. (2025). Impact and development of sport sponsorship: A three-decade bibliometric analysis (1993-2024). *Sport, Business and Management: An International Journal*, 15(2): 176-203. <https://doi.org/10.1108/SBM-09-2024-0134>
- [12] Su, X.Z., Chen, L., Xu, X.L. (2025). Carbon emission and energy risk management in mega sporting events: Challenges, strategies, and pathways. *Frontiers in Environmental Science*, 12. <https://doi.org/10.3389/fenvs.2024.1513365>
- [13] Green, D., Sewry, N., Derman, W., Killops, J., Boer, P.H., Jordaan, E., Schwellnus, M. (2024). A high incidence of serious life-threatening cardiovascular medical encounters during a marathon (2014-2019) calls for prevention strategies: SAFER XL. *The Physician and Sportsmedicine*, 53(1): 55-63. <https://doi.org/10.1080/00913847.2024.2399495>
- [14] Zafari, Z., Golzary, A., Rouhi, K., Mansourihanis, O. (2025). From conventional approaches to circular systems: Evolution of waste management in mega-sporting events. *Journal of the Air & Waste Management Association*, 75(5): 368-386. <https://doi.org/10.1080/10962247.2025.2462005>
- [15] Mattayakorn, K., Boonchom, V. (2025). Digital platform to enhance sports tourism in Songkhla province of Thailand. *Edelweiss Applied Science and Technology*, 9(2): 1000-1018. <https://doi.org/10.55214/25768484.v9i2.4641>
- [16] Her, R.S. (2024). Thoughts and practice of good enterprises. In *The Economy of Goodness*. Springer Nature Singapore, pp. 351-443. https://doi.org/10.1007/978-981-97-6363-4_12
- [17] Khonkaenmarathon. (2025). Race map. <https://www.khonkaenmarathon.com/4478/>
- [18] Könecke, T., Schunk, H., Schappel, T., Hugaerts, I., Wagner, F., Malchrowicz-Moško, E. (2021). German marathon runners' opinions on and willingness to pay for environmental sustainability. *Sustainability*, 13(18): 10337. <https://doi.org/10.3390/su131810337>
- [19] Triantafyllidis, S., Kaplanidou, K. (2019). Marathon runners: A fertile market for "green" donations? *Journal of Global Sport Management*, 6(4): 359-372. <https://doi.org/10.1080/24704067.2018.1561205>
- [20] Hussain, K., Raman, M., Falahat, M., Siddiqui, Y.A. (2024). Thai cultural tourism attributes: Emerging trends and sustainable practices. In *Cultural Tourism in the Asia Pacific*. Springer Nature Switzerland, pp. 103-114. https://doi.org/10.1007/978-3-031-63459-8_7
- [21] Rahman, M.H., Rahman, J., Tanchangya, T., Esquivias, M.A. (2023). Green banking initiatives and sustainability: A comparative analysis between Bangladesh and India. *Research in Globalization*, 7: 100184. <https://doi.org/10.1016/j.resglo.2023.100184>
- [22] Zhang, Y., Dong, Y., Zhang, Y., Wang, R., Jiang, J. (2024). Can organizations shape eco-friendly employees? Organizational support improves pro-environmental behaviors at work. *Journal of Environmental Psychology*, 93: 102200. <https://doi.org/10.1016/j.jenvp.2023.102200>
- [23] Stapleton, A., McHugh, L., Karekla, M. (2022). How to effectively promote eco-friendly behaviors: Insights from contextual behavioral science. *Sustainability*, 14(21): 13887. <https://doi.org/10.3390/su142113887>
- [24] Huang, Y., Chiu, W. (2024). Let's run green! Impact of runners' environmental consciousness on their green perceived quality and supportive intention at participatory sport events. *International Journal of Sports Marketing and Sponsorship*, 25(3): 541-559. <https://doi.org/10.1108/IJSMS-12-2023-0250>
- [25] Srichan, P.D., Sankaew, P.P.D. (2024). The soft power of Buddhism: Fostering social harmony and cultural identity in Thai society. *Journal of International Buddhist*

- Studies College, 10: 301-319.
- [26] Chunhabunyatip, P., Sasaki, N., Grünbühel, C., Kuwornu, J.K.M., Tsusaka, T.W. (2018). Influence of indigenous spiritual beliefs on natural resource management and ecological conservation in Thailand. *Sustainability*, 10(8): 2842. <https://doi.org/10.3390/su10082842>
- [27] Laphet, J., Tandamrong, D. (2025). Exploring airline passengers' environmental attitudes and behaviors: Factor analysis of carbon emission reduction strategies. *International Journal of Environmental Impacts*, 8(4): 655-665. <https://doi.org/10.18280/ijei.080403>
- [28] Chwialkowska, A., Bhatti, W.A., Glowik, M. (2020). The influence of cultural values on pro-environmental behavior. *Journal of Cleaner Production*, 268: 122305. <https://doi.org/10.1016/j.jclepro.2020.122305>
- [29] Tandamrong, D., Laphet, J. (2025). Exploring the influence of green mindset on passengers' intentions toward sustainable air travel: Evidence from Thailand. *Sustainability*, 17(16): 7254. <https://doi.org/10.3390/su17167254>
- [30] Lin, Y., Cai, C., Li, L. (2024). Research on perceived brand characteristics of marathon participants. *Scientific Reports*, 14(1): 30621. <https://doi.org/10.1038/s41598-024-81564-y>
- [31] Wang, F.J., Hsiao, C.H., Shih, W.H., Chiu, W. (2023). Impacts of price and quality perceptions on individuals' intention to participate in marathon events: Mediating role of perceived value. *Sage Open*, 13(2). <https://doi.org/10.1177/21582440231181431>
- [32] Case, R., Smith, B. (2018). The relationship between perceived event service quality and direct spending by marathon participants. *Global Sport Business Journal*, 6(1): 4.
- [33] Hair, J.F., Anderson, R.E. (2010). *Multivariate Data Analysis* (7th ed.). Pearson Education.
- [34] Fornell, C., Larcker, D.F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18(1): 39. <https://doi.org/10.2307/3151312>
- [35] Hair, J., Hollingsworth, C.L., Randolph, A.B., Chong, A.Y.L. (2017). An updated and expanded assessment of PLS-SEM in information systems research. *Industrial Management & Data Systems*, 117(3): 442-458. <https://doi.org/10.1108/IMDS-04-2016-0130>
- [36] Nunnally, J.C. (1978). An overview of psychological measurement. In *Clinical Diagnosis of Mental Disorders*. Springer US, pp. 97-146. https://doi.org/10.1007/978-1-4684-2490-4_4
- [37] Jayasekara, K.D.D.S., Rajapaksa, D., Gunawardena, U.A.D.P. (2024). Impacts of environmental knowledge, motives, and behavior on ecotourism. *Sustainability*, 16(11): 4724. <https://doi.org/10.3390/su16114724>
- [38] Kanada, M., Norman, P., Kaida, N., Carver, S. (2022). Linking environmental knowledge, attitude, and behavior with place: A case study for strategic environmental education planning in Saint Lucia. *Environmental Education Research*, 29(7): 929-950. <https://doi.org/10.1080/13504622.2022.2074376>
- [39] Jang, W.Y., Choi, E.Y. (2025). Going green for sustainability in outdoor sport brands: Consumer preferences for eco-friendly practices. *Sustainability*, 17(10): 4320. <https://doi.org/10.3390/su17104320>
- [40] Parmar, V.S. (2025). The impact of environmental sustainability practices on sports tourism: Challenges and opportunities. *Idealistic Journal of Advanced Research Progress Spectrum*, 4(2): 20-28.
- [41] Chauhan, D.S. (2024). Exploring the potential and challenges of sports tourism in Uttar Pradesh: Emerging trends, strategic initiatives and sustainable development. *Idealistic Journal of Advanced Research Progress Spectrum*, 3: 35-43.
- [42] Ye, Y., Su, C.H., Tsai, C.H., Hung, J.L. (2020). Motivators of attendance at eco-friendly events. *Journal of Convention Event Tourism*, 21(5): 417-437. <https://doi.org/10.1080/15470148.2020.1776656>
- [43] Meissner, L.P., Peterson, S., Semrau, F.O. (2024). It's not a sprint, it's a marathon: Reviewing governmental R&D support for environmental innovation. *Journal of Environmental Planning and Management*. <https://doi.org/10.1080/09640568.2024.2359442>
- [44] Hsiao, C.H., Wang, F.J., Lu, Y.C. (2020). Development of sustainable marathon running: The consumer socialization perspective. *Sustainability*, 12(18): 7776. <https://doi.org/10.3390/su12187776>
- [45] Maloş, C.V., Hartel, T., Bobiş, D., Silviu Pascu, I. (2025). Sustainability assessment of trail running events in Romania: Insights from race regulations and location data. *Mountain Research and Development*, 45(2): R19-R26. <https://doi.org/10.1659/mrd.2024.00023>
- [46] Dong, X., Liu, S., Li, H., Yang, Z., Liang, S., Deng, N. (2020). Love of nature as a mediator between connectedness to nature and sustainable consumption behavior. *Journal of Cleaner Production*, 242: 118451. <https://doi.org/10.1016/j.jclepro.2019.118451>
- [47] Pearce, J., Huang, S., Dowling, R.K., Smith, A.J. (2022). Effects of social and personal norms, and connectedness to nature, on pro-environmental behavior: A study of Western Australian protected area visitors. *Tourism Management Perspectives*, 42: 100966. <https://doi.org/10.1016/j.tmp.2022.100966>
- [48] Oh, R.R.Y., Fielding, K.S., Nghiem, L.T.P., Chang, C.C., Carrasco, L.R., Fuller, R.A. (2021). Connection to nature is predicted by family values, social norms and personal experiences of nature. *Global Ecology and Conservation*, 28: e01632. <https://doi.org/10.1016/j.gecco.2021.e01632>

APPENDIX

Table A1. Discriminant validity using the Fornell–Larcker criterion

Construct	EA	SD	BI	PQ	GMS
EA	0.882				
SD	0.811	0.874			
BI	0.796	0.870	0.840		
PQ	0.743	0.787	0.785	0.879	
GMS	0.787	0.768	0.794	0.827	0.883

Notes: Environment Awareness (EA), Self-Determination Theory (SD) Behavioural Intention (BI), Green Marathon Perceived Quality (PQ), Green Marathon Spending in Thailand (GMS)