

LEVERAGING AUTHENTICITY AND SUSTAINABILITY AWARENESS FOR COMPETITIVE ADVANTAGE IN EXPERIENTIAL AGROTOURISM

NOOR ASIAH HASSAN ^{1*}, ROSMAWATI MAHFAR ², YUSMAN ISTIHAT³,
UMMI RAIDA AWANG ZAKI⁴, NAFIZA MAHAYUDDIN⁵, SAKINAH MD TAJULARIFIN⁶

^{1, 2,3,4,5,6} Universiti Selangor, Malaysia

*Corresponding Author: noorasiah@unisel.edu.my

Abstract: This study examines the psychological and experiential drivers of visitor loyalty and advocacy within the growing niche of experiential agrotourism. By integrating agricultural activities with hands-on learning, experiential agrotourism offers a meaningful platform for connecting visitors with local culture, heritage, and sustainability values. However, empirical evidence identifying the determinants of behavioural intention beyond basic satisfaction remains limited. This study addresses this gap by analysing key experiential factors influencing visitor loyalty and behavioural intention at Festival Xplorasa (Warisan Merdeka), an agro-cultural event held at the Selangor Fruit Valley, Malaysia. A quantitative, cross-sectional survey design was employed, with primary data collected from 103 participants. The analytical framework comprised six constructs: satisfaction, perceived value, cultural learning, sustainability awareness, authenticity, and behavioural intention. Correlation and multiple regression analyses were conducted to evaluate their predictive influence. The findings revealed strong positive correlations among all constructs. The regression model demonstrated high explanatory power, accounting for 88.8% of the variance in behavioural intention ($R^2 = 0.888$, $F = 78.95$, $p < .001$). Authenticity ($\beta = .638$, $p < .001$) and sustainability awareness ($\beta = .220$, $p = .041$) emerged as significant predictors, while satisfaction, perceived value, and cultural learning showed positive but non-significant effects. The results emphasise the importance of authentic and sustainability-focused experiences in strengthening visitor loyalty and advocacy in agro-cultural tourism.

Keywords: Experiential Agrotourism, Authenticity, Sustainability Awareness, Behavioural Intention, Cultural Learning

1. Introduction

Tourism is increasingly recognised as a platform for advancing sustainability, community engagement, and the preservation of cultural heritage (United Nations World Tourism Organization [UNWTO], 2022). Within this broader agenda, experiential agrotourism has emerged as a significant niche, integrating agricultural activities with meaningful learning experiences for visitors (Dangi, 2018; Sangnak et al., 2025). This form of tourism not only diversifies rural economies but also fosters closer connections between tourists, local communities, and the natural environment (Davidović et al., 2025). According to a media release by Selangor.Travel (2023), agrotourism is a strategic priority for sustainable tourism

development in Malaysia, with Selangor positioned as a key hub due to its proximity to major urban centres.

Beyond agricultural attractions, festivals and events function as powerful vehicles for experiential engagement by blending cultural immersion with participatory activities (Abhirami & Vineeth, 2025). Festival tourism creates opportunities for cultural appreciation and destination branding, which in turn enhance visitor satisfaction and loyalty (Getz & Page, 2024). Grounded in experiential tourism theory, meaningful experiences emerge when participants actively engage, reflect, and internalise learning processes (Kolb, 1984; Pine & Gilmore, 1999). These processes are particularly relevant to agrotourism festivals that combine hands-on activities, cultural demonstrations, and social interaction. Previous studies indicate that authentic experiences strengthen visitor satisfaction, perceived value, and revisit intentions (Kim et al., 2012; He & Timothy, 2024). Similarly, Liang et al. (2021) reported that agritourism activities that meet visitors' expectations are more likely to result in satisfying experiences.

Festival Xplorasa, held at Selangor Fruit Valley, exemplifies Selangor's commitment to experiential agrotourism through cultural learning and sustainability awareness. By integrating family-oriented runs, traditional *kuih*-making activities, and fruit fairs showcasing local produce, the festival aligns closely with national heritage and sustainability objectives. Despite growing interest in such events, empirical research remains limited on how visitors' perceptions of authenticity and sustainability influence behavioural intentions within this context (Zhang & Deng, 2022). Addressing this gap, the present study examines five experiential constructs to predict visitors' behavioural intentions. The findings are expected to extend theoretical understanding of experiential agrotourism while offering practical insights for the design of culturally authentic and sustainability-oriented rural tourism experiences in Selangor and beyond.

2. Problem Statement

The central research problem addressed in this study is the absence of a robust, predictive, and empirically validated understanding of how authenticity (Kim et al., 2012; He & Timothy, 2024) and sustainability awareness (Zhang & Deng, 2022) jointly shape visitors' behavioural intentions in experiential agrotourism festivals. Although experiential agrotourism is widely promoted as a catalyst for rural development, cultural preservation, and sustainable economic growth (Dangi, 2018; Sangnak et al., 2025), industry evaluations continue to rely largely on satisfaction-based and retrospective measures (Liang et al., 2021). Such approaches capture post-visit assessments but provide limited insight into the underlying psychological mechanisms that drive future loyalty and repeat visitation.

Moreover, existing studies seldom integrate authenticity and sustainability awareness within a unified behavioural framework, nor do they examine their combined effects in the specific context of agrotourism festivals, where cultural immersion, perceived genuineness, and environmentally responsible practices constitute core experiential elements (Davidović et al., 2025; Abhirami & Vineeth, 2025). As a result, a significant theoretical and empirical gap persists. It remains unclear whether these experiential dimensions function as strong, direct

predictors of long-term re-patronage intentions beyond conventional satisfaction variables. This knowledge gap constrains festival organisers, rural tourism planners, and policymakers in identifying which experiential attributes should be prioritised to enhance competitiveness, strengthen visitor loyalty, and support Malaysia's broader sustainability and rural tourism objectives.

3. Literature Review

3.1 Sustainability in Malaysian Agrotourism

Sustainability remains a cornerstone of the long-term viability of agrotourism in Malaysia. Recent case studies, including durian-based agrotourism initiatives in Balik Pulau, underscore the pivotal role of farm entrepreneurs' commitment to sustainable agricultural and tourism practices. These enterprises commonly incorporate eco-friendly pest management, organic farming techniques, and community-led cultural preservation into their operations (Nor Ziana Mohd Uzir, 2024). In addition, innovation in product offerings such as edutainment activities and value-added agricultural products has enabled farms to navigate economic uncertainty while sustaining visitor interest. The integration of sustainability principles with innovation enhances the long-term appeal of agrotourism destinations and aligns closely with national policies that promote green growth and rural resilience (Jaunis et al., 2022).

3.2 Agrotourism Development Sector in Selangor

Selangor has actively transformed its agricultural sector by positioning farms as tourism destinations. The Ministry of Agriculture and Food Security offers grants of up to RM200,000 to small and micro-enterprises engaged in agrotourism, supporting the development of infrastructure, visitor centres, and experiential farm-based activities. Areas such as Sabak Bernam and Sungai Panjang have gained popularity for farm tours set amid extensive padi fields, attracting visitors from the Klang Valley, particularly senior citizens and family groups. Improved accessibility through the West Coast Expressway has further facilitated visitor inflows. Tour operators report consistent weekly arrivals via organised bus tours, complemented by independent weekend visitors. Nevertheless, balancing tourism demand with agricultural production cycles remains a persistent challenge, requiring careful coordination between tour operators and farm owners (Chen, 2025; Malay Mail, 2025).

Notably, the Visit Selangor Year 2025 campaign aims to attract 8 million visitors and generate an estimated RM11.7 billion in tourism receipts, signalling strong market optimism and sustained promotion of agro- and eco-tourism. Events such as the Terminal Sekinchan Festival, which drew approximately 13,000 visitors over two days, reflect the growing demand for agro-cultural experiences centred on padi landscapes, community health initiatives, and environmental volunteerism (Business Today Editorial, 2025; Akmar Annuar, 2024).

3.3 Visitor Demographics and Market Potential

Agrotourism in Selangor primarily serves urban residents, with a notable concentration of senior citizens and family groups from metropolitan areas. These visitors are attracted by the rustic environment and hands-on agricultural experiences that are largely unavailable in urban settings. Peak visitation periods, particularly on weekends, are characterised by organised group tours via chartered buses, underscoring the commercial viability of agrotourism enterprises. This pattern points to a robust and expanding market that may be further developed through targeted marketing strategies and diversified offerings tailored to distinct visitor segments (The Star Online, 2025).

3.4 Policy Frameworks and Coordinated Development Efforts

The sustainable growth of agrotourism in Malaysia depends on coherent policy frameworks and effective cross-sector collaboration. Policy analyses emphasise the importance of integrated approaches that align economic development objectives with cultural heritage preservation and environmental conservation. Supportive policies facilitate access to funding, training, and infrastructure improvements for small-scale agro-entrepreneurs. Moreover, strategic partnerships among agricultural agencies, tourism authorities, and local communities are essential for addressing operational challenges and ensuring that agrotourism initiatives contribute meaningfully to broader rural development and sustainable tourism goals (Jaunis et al., 2022).

3.5 Determinants of Visitor Loyalty in Experiential Agrotourism

Visitor loyalty is a critical determinant of sustainability in agrotourism operations. Recent studies identify several key antecedents, including motivation, experience quality, satisfaction, and connection to tradition. Visitor motivation both push factors (such as the desire for relaxation or escape) and pull factors (such as farm attributes and activities) positively influences loyalty by shaping overall experience quality (Ferdiyanti et al., 2025). Experience quality reflects visitors' perceptions of educational, entertainment, and escapist dimensions, which directly enhance satisfaction and loyalty intentions (Hai Ha et al., 2023).

Satisfaction plays a central mediating role between experience quality and behavioural outcomes, including revisit and recommendation intentions. Visitors who are satisfied with personalised interactions, farm-based activities, and immersive cultural encounters tend to develop stronger emotional attachment and a greater likelihood of return visits (Ferdiyanti et al., 2025; Hai Ha et al., 2023). Authenticity and connection to tradition further reinforce these outcomes. Participation in genuine farm practices, such as traditional rice planting or local food production workshops, enhances experiential satisfaction and fosters loyalty. Emotional memories formed through authentic experiences also stimulate positive word-of-mouth and repeat visitation (Ray, 2013). Consequently, agrotourism destinations that effectively integrate motivation, high-quality experiences, satisfaction, and authentic cultural elements are better positioned to achieve sustained competitive advantage.

3.6 Behavioural Intention in Experiential Agrotourism

Behavioural intention in experiential agrotourism is a multidimensional construct shaped by visitors' cognitive and affective evaluations of their experiences. It extends beyond satisfaction to encompass deeper psychological dimensions, including perceived authenticity, environmental awareness, and emotional engagement. Drawing on the Theory of Planned Behaviour (Ajzen, 1991) and experiential tourism theory (Pine & Gilmore, 1999), recent research suggests that intentions to revisit, recommend, or support agrotourism activities are influenced by perceived value, destination image, and memorable sensory experiences. While satisfaction remains a strong predictor of behavioural intention, this relationship is often mediated by experiential dimensions such as entertainment, aesthetics, education, and escapism, which collectively enhance perceived authenticity (Dina et al., 2019; Aditya et al., 2023).

Environmental consciousness further moderates behavioural intention, as visitors who perceive agrotourism offerings to be sustainable and environmentally responsible are more likely to develop favourable future intentions (Gao et al., 2023). Extensions of the Theory of Planned Behaviour also incorporate variables such as electronic word-of-mouth, perceived risk, and environmental experience, highlighting the combined influence of social and psychological factors in agrotourism decision-making (Zhenbin et al., 2024). Overall, the interaction between satisfaction, authenticity, sustainability awareness, and emotional connection underscores the importance of designing agrotourism experiences that are not only enjoyable but also meaningful and sustainable in fostering long-term visitor engagement and loyalty.

4. Hypothesis Development

4.1 Satisfaction and Behavioural Intention

Visitor satisfaction is a well-established and critical predictor of behavioural intention in tourism contexts, including experiential agrotourism (Chen & Tsai, 2007). Satisfied visitors are more likely to form intentions to revisit a destination or recommend it positively to others, a relationship consistently supported by empirical evidence. Within experiential tourism, satisfaction commonly arises from fulfilling, educational, and engaging encounters that shape favourable overall evaluations of the experience. However, recent studies suggest that satisfaction alone does not fully capture the complexity of experiential engagement. For example, Bag et al. (2021) found that experiential satisfaction moderates the relationship between experiential quality and behavioural intention, indicating that deeper forms of engagement—such as emotional and sensory involvement strengthen this relationship.

Similarly, tourists' memorable experiences and active participation in tourism activities not only enhance satisfaction but also intensify behavioural intentions, particularly when perceived value offsets financial costs (Ge & Chen, 2024). Moreover, the environmental and restorative qualities of rural and agrotourism settings influence visitors' cognitive and emotional responses, which subsequently shape both satisfaction and behavioural intentions (Zhu et al., 2025). Thus, while satisfaction positively influences behavioural intention in

experiential agrotourism, its effect is more nuanced when considered alongside experiential quality and affective dimensions. This complexity underscores the importance of conceptualising satisfaction within a broader experiential framework when predicting behavioural intentions. Accordingly:

H1: Satisfaction positively influences behavioural intention in experiential agrotourism.

4.2 Perceived Value and Behavioural Intention

Perceived value plays a crucial role in shaping behavioural intention in experiential agrotourism by reflecting visitors' evaluations of benefits received relative to costs incurred (Zeithaml, 1988; Wang et al., 2025). Recent research highlights the multidimensional nature of perceived value in agrotourism, encompassing environmental, emotional, functional, and social values, with environmental value often exerting the strongest influence on behavioural intentions (Wang et al., 2025; Zhao et al., 2025). Visitors who perceive agrotourism experiences as valuable whether through cultural enrichment, meaningful social interaction, emotional fulfilment, or favourable cost–benefit outcomes are more likely to develop positive intentions such as revisiting, recommending the destination, or supporting sustainable practices.

The restorative qualities of rural and agrotourism environments further contribute to tourists' hedonic and eudaimonic experiences, enhancing destination image and fostering long-term loyalty (Zhu et al., 2025). Moreover, studies integrating perceived value theory with the Theory of Planned Behaviour demonstrate that perceived value significantly influences visitors' attitudes and subjective norms, thereby shaping behavioural intentions beyond the effect of satisfaction alone (Zhao, et al., 2025). Collectively, these findings position perceived value as a pivotal driver of behavioural intention in experiential agrotourism, particularly where sustainability and authenticity are salient features of the visitor experience. Therefore:

H2: Perceived value positively influences behavioural intention in experiential agrotourism.

4.3 Cultural Learning and Behavioural Intention

Recent studies emphasise the significant role of cultural learning in shaping behavioural intentions within experiential agrotourism (Wang et al., 2025). Active participation in hands-on cultural activities enables visitors to acquire knowledge and appreciation of local traditions, fostering deeper emotional connections and stronger destination attachment (Richards, 2011; Kim et al., 2012). Engaging activities such as traditional crafts, culinary experiences, and storytelling not only enrich visitors' understanding of local culture but also enhance perceptions of authenticity and personal meaning, thereby strengthening intentions to revisit or recommend the destination (Zhang et al., 2020).

The psychological mechanisms underlying this relationship include heightened cultural identity, a sense of belonging, and increased perceived cultural value, all of which positively influence future behavioural intentions (Abdelghani et al., 2025). Furthermore, recent evidence suggests that cultural learning functions as a mediating mechanism through

knowledge transfer and cultural memory, directly shaping tourists' emotional responses and loyalty towards cultural and agrotourism destinations (Yang et al., 2025). In summary, immersive cultural learning experiences exert a significant positive influence on behavioural intentions by strengthening both cognitive and emotional bonds with local culture, thereby contributing to sustainable tourism development. Hence:

H3: Cultural learning positively influences behavioural intention in experiential agrotourism.

4.4 Sustainability Awareness and Behavioural Intention

Sustainability awareness in experiential agrotourism reflects visitors' understanding and appreciation of environmental, social, and economic sustainability practices embedded within tourism experiences (Weaver, 2015). When agrotourism destinations actively implement sustainable practices such as waste reduction, local sourcing, environmental education, and community engagement—visitors are more likely to develop emotional bonds and moral satisfaction aligned with personal values and environmental responsibility (Han et al., 2010). Recent research indicates that sustainability awareness not only enhances cognitive recognition of responsible tourism but also stimulates metacognitive reflection, encouraging visitors to regulate their behaviours towards more environmentally and socially responsible actions (Hadinejad et al., 2025).

This reflective process fosters empathy towards local communities and the natural environment, reinforcing behavioural intentions related to revisiting, recommending, and supporting sustainability initiatives within agrotourism contexts. Empirical studies grounded in the Theory of Planned Behaviour further demonstrate that sustainability awareness significantly influences tourists' attitudes and subjective norms, which are critical determinants of behavioural intention (Nguyen, 2025). Additionally, eco-conscious marketing communications that effectively convey sustainability efforts have been shown to heighten environmental awareness and strengthen pro-environmental behavioural intentions during and beyond the visit (Zhang et al., 2025). Consequently, sustainability awareness serves as a key psychological mechanism that enhances behavioural intentions through moral engagement and emotional connection, thereby reinforcing long-term visitor loyalty and advocacy. Thus:

H4: Sustainability awareness positively influences behavioural intention in experiential agrotourism.

4.5 Authenticity and Behavioural Intention

Authenticity is a foundational concept in experiential tourism, denoting the perceived genuineness and cultural integrity of visitor experiences (MacCannell, 1973; Wang, 1999). In agrotourism festivals, authenticity is conveyed through genuine cultural practices, traditional food preparation, and active community participation, enabling visitors to form emotional connections with local heritage. Empirical evidence consistently demonstrates that authentic experiences significantly enhance behavioural intentions, particularly intentions to revisit and recommend destinations (Zhou et al., 2022). Studies within farm-to-table agrotourism

contexts further reveal that experiential dimensions such as entertainment, aesthetics, education, and escapism enhance perceived authenticity, which in turn strongly predicts revisit intentions (Do & Nguyen, 2025).

The influence of authenticity is further strengthened through its interaction with sustainability perceptions, as environmental consciousness moderates the relationship between authenticity and behavioural intention (Bakr et al., 2025). Additional research indicates that authentic experiences evoke nostalgia and emotional solidarity with host communities, thereby supporting long-term visitor loyalty in rural tourism settings (Zhou et al., 2025). Sensory and interactive authenticity also plays a vital role in deepening visitor engagement, learning, and place attachment, ultimately fostering favourable behavioural intentions (Martinus et al., 2024). Overall, authenticity in experiential agrotourism not only fulfils visitors' desire for genuine cultural immersion but also strategically supports sustainable tourism development by strengthening behavioural intentions and loyalty. Therefore:

H5: Authenticity positively influences behavioural intention in experiential agrotourism.

5. Conceptual Framework

The proposed conceptual framework, illustrated in Figure 1, is designed to rigorously test the hypothesised causal relationships between key experiential constructs and visitor commitment within the distinctive context of experiential agrotourism. The model positions behavioural intention as the dependent variable, predicted by satisfaction, perceived value, cultural learning, sustainability awareness, and authenticity. It integrates both cognitive (perceived value and sustainability awareness) and affective (satisfaction, authenticity, and cultural learning) dimensions of experiential tourism, while explicitly foregrounding authenticity and sustainability as central experiential drivers in agrotourism settings.

The framework is anchored by behavioural intention as the dependent variable. In tourism management research, this construct captures long-term visitor loyalty, encompassing intentions to re-patronise (such as revisiting the destination or event) and to engage in positive word-of-mouth advocacy. Measuring behavioural intention is critical for evaluating the sustainable and commercial viability of agrotourism initiatives, as it provides predictive insight that extends beyond purely retrospective measures of visitor satisfaction.

The framework proposes that behavioural intention is influenced by five independent experiential constructs: satisfaction, perceived value, cultural learning, sustainability awareness, and authenticity. The inclusion of these variables is theoretically grounded in experiential tourism literature, which emphasises the interplay between cognitive and affective dimensions of visitor experiences. The cognitive components perceived value and sustainability awareness reflect visitors' rational evaluations of benefits received and the extent to which experiences align with their environmental values and beliefs. In contrast, the affective and experiential components satisfaction, cultural learning, and authenticity capture emotional responses, depth of engagement, and the sensory and symbolic quality of the event experience.

By integrating these dimensions, the model accounts for both functional outcomes (perceived value and satisfaction) and higher-order psychological and ethical factors (authenticity, cultural learning, and sustainability awareness) that are particularly salient within agro-cultural tourism environments. This holistic approach strengthens the explanatory power of the framework in predicting behavioural intention and offers a more comprehensive understanding of visitor commitment in experiential agrotourism contexts.

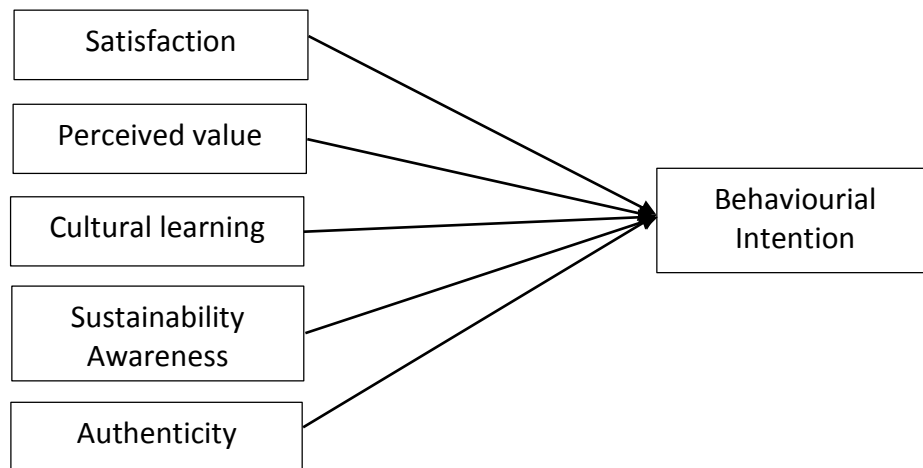


Figure 1. Conceptual framework

5 Methodology

This study adopted a cross-sectional causal research design to examine the influence of satisfaction, perceived value, cultural learning, sustainability awareness, and authenticity on behavioural intention. Data were collected at a single point in time to analyse relationships among the study variables and to infer potential causal associations within the constraints of a cross-sectional approach. Hypotheses were developed to guide the analysis and were tested using SPSS version 26, providing empirical evidence to evaluate the proposed relationships. Data were obtained from 103 participants who attended the Xplorasa event, using a purposive sampling technique to ensure practicality and feasibility. While this approach enabled access to relevant respondents with direct experience of the event, it is acknowledged that, as with all non-probability sampling methods, certain limitations remain.

Data collection was conducted using structured questionnaires distributed upon completion of the event. Prior to participation, respondents were informed of the study's objectives, assured of confidentiality, and advised that participation was entirely voluntary. For convenience and efficiency, the survey was administered online via Google Forms. The study utilised a structured questionnaire comprising validated measurement scales for six key constructs: satisfaction, perceived value, cultural learning, sustainability awareness, authenticity, and behavioural intention. Measurement items were adapted from established instruments in previous studies to ensure content validity and contextual suitability. All items

were measured using a five-point Likert scale. Table 1 summarises the instruments employed, including the number of items for each construct, the original sources of the adapted scales, and the scale intervals. The final section of the questionnaire captured respondents' demographic characteristics.

Table 1: Instruments Used in Research

Construct	No of items	Adapted from	Scale
Satisfaction	5	Oliver (1997)	5 Likert scale
Perceived value	4	Zeithaml (1988)	
Cultural learning	5	Kim et al., (2012)	
Sustainability	5	Barbieri (2013)	
Authenticity	3	Wang (1999)	
Behavioural Intention	5	Yoon & Uysal (2005)	

6. Results

The study comprised 103 participants, of whom 65% were female (N = 67) and 35% were male (N = 36). The majority of respondents were aged 18–29 years (68.9%, N = 71), followed by those aged 30 years and above (31.1%, N = 32). Notably, over 87% of participants indicated that this was their first visit to Selangor Fruit Valley. Descriptive analysis was conducted in accordance with the procedure outlined by Best and Kahn (1977), as presented in Table 2.

Table 2. Descriptive Statistics and Construct Reliability

Construct	Mean	Std. Dev	Indicator	Cronbach Alpha	KMO	TVE (%)
Satisfaction	3.88	0.84	High	0.88	0.78	75
Perceived Value	3.86	0.61	High	0.90	0.74	85
Cultural Learning	4.21	0.73	Very high	0.92	0.82	78
Sustainability Awareness	4.29	0.75	Very high	0.95	0.88	83
Authenticity	4.31	0.72	Very high	0.94	0.76	90
Behavioural Intention	4.25	0.78	Very high	0.94	0.86	83

Overall, the respondents reported high levels of positive perception across all constructs that indicate favourable experiences with the *Festival Xplorasa* event. Mean scores ranged from high to very high on a 5-point Likert scale that suggesting that participants generally valued the festival's cultural, educational, and sustainability components. Authenticity and sustainability awareness recorded the highest means which implying that visitors perceived the festival as both genuine and environmentally meaningful. Pearson's correlation coefficients were calculated to examine the relationships among the six constructs, as presented in Table 3. The findings reveal strong, positive correlations across all variables, with coefficients ranging from $r = .561$ to $r = .930$ ($p < .001$). Behavioural intention demonstrated the strongest association with authenticity ($r = .930$), followed by cultural learning ($r = .878$), sustainability awareness ($r = .863$), satisfaction ($r = .728$), and perceived value ($r = .665$).

Table 3. Correlation Analysis between Satisfaction, Perceived Value, Sustainability Awareness, Cultural Learning, Authenticity, and Behavioural Intentions

Dimensions		Satisfaction	Perceived Value	Sustainability Awareness	Cultural Learning	Authenticity	Behavioural Intention
Satisfaction		1					
Perceived Value		.561**	1				
Sustainability Awareness	Pearson Coefficient	.701**	.684**	1			
Cultural Learning		.695**	.707**	.875**	1		
Authenticity		.719**	.681**	.847**	.902**	1	
Behavioural Intention		.728**	.665**	.863**	.878**	.930**	1

** Correlation is significant at the 0.01 level (2-tailed).

These findings indicate that visitors who perceived the event as authentic, educational, and sustainability oriented were more likely to express intentions to revisit or recommend it. Although several bivariate correlations were high (for example, Authenticity vs Cultural Learning, $r = .902$), multicollinearity diagnostics supported retention of the constructs. Specifically, VIFs ranged from 2.1 to 7.3 while no universal cutoff exists, methodological authorities recommend interpreting VIF rules-of-thumb in context and combining VIF with other diagnostics (e.g., tolerance, condition indices, and examination of standard-error inflation). In line with common practice in PLS-SEM and tourism or hospitality research, VIF values up to the single-digit range can be tolerated if they do not materially inflate coefficient variances. (O'Brien, 2007).

As shown in Table 4, the results indicate strong positive interrelationships among all constructs. The regression model explained 88.8% of the variance in behavioural intention ($R^2 = 0.888$, $F = 78.95$, $p < .001$). Among the predictors, authenticity ($\beta = .638$, $p < .001$) and sustainability awareness ($\beta = .220$, $p = .041$) exerted significant positive effects on behavioural intention, whereas satisfaction, perceived value, and cultural learning, although positive, were not statistically significant (see Table 5). These findings suggest that authentic and sustainability-oriented experiences play a central role in shaping visitors' emotional engagement and loyalty within experiential agrotourism contexts.

Table 4. Model Summary: Regression of Independent Variables Towards Behavioural Intention

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.942 ^a	.888	.876	.278

a. Predictors: (Constant), Authenticity, Perceived Value, Satisfaction, Cultural Learning, Sustainability Awareness

Table 5. Regression result for all factors toward Behavioural intention

Model		Unstd Coefficients		Std Coeff	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-.253	.258		-.981	.331		
	Satisfaction	.071	.066	.075	1.065	.292	.450	2.222
	Perceived Value	-.005	.091	-.004	-.056	.955	.476	2.102
	Sustainability Awareness	.231	.110	.220	2.095	.041	.203	4.919
	Cultural Learning	.064	.138	.059	.462	.646	.137	7.303
	Authenticity	.696	.129	.638	5.398	.000	.161	6.216

a. Dependent Variable: Behavioural Intention

7. Discussion

The primary objective of this study was to identify the most influential experiential and psychological drivers of long-term visitor loyalty (behavioural intention) within the niche context of agro-cultural festival tourism. Overall, the findings demonstrate that the proposed conceptual framework is robust and offers meaningful strategic insights for the sustainable development of Malaysia's rural tourism sector. The regression model explained a substantial proportion of the variance in behavioural intention ($R^2 = 0.888$), indicating an excellent model fit. This result suggests that the combined effects of satisfaction, perceived value, sustainability awareness, cultural learning, and authenticity provide strong explanatory power in predicting visitors' intentions to revisit or recommend an agrotourism festival. The statistically significant F-test ($F = 78.947, p < .001$) further confirms that the model, as a whole, makes a significant contribution to explaining behavioural intention.

Among the predictors, authenticity emerged as the most influential determinant of behavioural intention ($\beta = .638, p < .001$). This finding indicates that visitors who perceived the festival as genuinely representing local culture and traditions were significantly more inclined to return to the destination and engage in positive word-of-mouth. This strong effect is consistent with experiential tourism theory, which posits that authentic experiences foster deeper emotional connections and enduring loyalty (Kim & Jamal, 2007; Pine & Gilmore, 1999). In the context of Festival Xplorasa, activities such as traditional *kuih*-making, fruit exhibitions, and heritage-based storytelling appear to have reinforced visitors' perceptions of cultural authenticity and immersive engagement.

Sustainability awareness also exerted a significant positive influence on behavioural intention ($\beta = .220, p = .041$). This suggests that visitors who developed greater awareness of environmental and agricultural sustainability through participation in the festival were more likely to support and revisit similar events. This outcome aligns with broader trends in eco-conscious tourism, where visitors increasingly favour experiences that reflect responsible consumption, conservation, and ethical values (Weaver, 2015). The finding underscores the potential of agrotourism festivals to function as effective platforms for environmental education, simultaneously enhancing visitor loyalty and advancing community-level sustainability objectives.

In contrast, satisfaction and perceived value, although positively correlated with behavioural intention ($r = .728$ and $r = .665$, respectively), did not emerge as significant predictors when all variables were included in the regression model. This pattern suggests the presence of multicollinearity, as these constructs overlap conceptually with authenticity and sustainability awareness. Visitors may perceive authentic and meaningful experiences as inherently satisfying and valuable, thereby reducing the distinct explanatory contribution of satisfaction and perceived value when considered alongside higher-order experiential factors. Similarly, cultural learning did not demonstrate a unique effect in the regression analysis despite its strong correlation with behavioural intention ($r = .878$). This outcome is likely attributable to its substantial overlap with authenticity ($r = .902$), as both constructs capture dimensions of immersive engagement with local culture and traditions. In practice, the experience of authenticity may subsume cultural learning, diminishing its independent predictive power.

The variance inflation factor (VIF) values for cultural learning (7.303) and authenticity (6.216) indicate moderate to relatively high multicollinearity, reflecting their close conceptual relationship. Nevertheless, authenticity was retained in the model due to its central theoretical importance in agrotourism experiences. Future research may benefit from refining these constructs or employing Structural Equation Modelling (SEM) to examine latent relationships and better disentangle overlapping experiential dimensions. Such approaches could provide deeper insights into the hierarchical and interdependent nature of authenticity, cultural learning, and sustainability awareness in shaping behavioural intention within experiential agrotourism contexts.

8. Implications of the Study

The findings of this study yield important and actionable implications across three interrelated domains: the practical management of agro-cultural events, strategic policy development for sustainable tourism, and contributions to the academic literature.

8.1 Practical and Managerial Implications

This study offers a data-driven blueprint for event organisers, including the management team of Festival Xplorasa, as well as tourism authorities such as Tourism Selangor, seeking to strengthen competitive advantage through enhanced visitor loyalty. A key managerial implication concerns the prioritisation of authentic experience curation. As authenticity emerged as the strongest predictor of behavioural intention, resources should be redirected from generic entertainment towards carefully curated, meaningful, and participatory cultural experiences. Event organisers are encouraged to design immersive activities such as traditional cooking sessions, local craft demonstrations, and direct interactions with farmers, as these engagements foster deeper emotional resonance and reinforce the festival's distinctive cultural identity.

A further critical implication relates to the strategic integration of sustainability principles. The significant influence of sustainability awareness indicates that sustainability should be embedded within the core design of the festival rather than presented as a

symbolic or peripheral feature. Practical measures include the implementation of visible waste-reduction systems, the enforcement of eco-friendly packaging among vendors, the promotion of locally sourced produce, and clear communication of the event's environmental commitments. Such tangible initiatives strengthen alignment between visitors' ethical values and the destination, thereby enhancing intentions to revisit and recommend the festival.

Finally, the finding that satisfaction and perceived value did not significantly predict behavioural intention highlights the need for a reassessment of performance evaluation practices. Rather than relying predominantly on retrospective satisfaction measures, long-term performance indicators should focus on the quality of authentic experiences and the effectiveness of sustainability awareness initiatives. By realigning evaluation frameworks around these empirically supported drivers of loyalty, event organisers and tourism authorities can better inform strategic planning and maintain relevance within an increasingly competitive tourism environment.

8.2 Theoretical and Methodological Implications

This study also makes a meaningful contribution to the experiential tourism and loyalty literature. By empirically demonstrating that authenticity and sustainability awareness function as strong and distinct predictors of behavioural intention, the research extends experiential tourism theory beyond traditional hedonic and satisfaction-based explanations of loyalty. The findings support the argument that long-term visitor commitment is driven by deeper cognitive and affective value alignment rather than surface-level enjoyment alone. In addition, the results provide empirical support for the application of Value–Belief–Norms theory in explaining destination loyalty within an agro-cultural tourism context.

For tourism planners, the findings underscore the importance of prioritising participatory cultural activities that generate emotional and meaningful engagement. For sustainability advocates, the results highlight the necessity of integrating sustainability practices—such as waste reduction, eco-friendly packaging, and local sourcing directly into festival design. From a methodological perspective, future research is encouraged to further examine the mediating or moderating roles of authenticity and sustainability awareness using larger samples or longitudinal designs to enhance explanatory robustness.

9. Conclusion

This study addresses a critical empirical gap in the experiential agrotourism literature by identifying the key psychological and experiential determinants of long-term visitor loyalty beyond conventional satisfaction metrics. The findings demonstrate that authenticity and sustainability awareness are the primary and statistically significant predictors of positive behavioural intention among agrotourism festival visitors. This supports the central proposition that competitive advantage in rural tourism is achieved not through superficial entertainment, but through deep emotional and ethical value alignment with visitors.

Authenticity emerges as the emotional anchor of visitor commitment, confirming that genuine representations of local culture and agricultural heritage remain the most powerful catalysts for re-patronage and positive advocacy. Similarly, the significant role of

sustainability awareness reflects a contemporary shift in visitor expectations, whereby environmentally responsible practices are now integral to tourism decision-making processes. In contrast, the non-significant direct effects of satisfaction, perceived value, and cultural learning when considered alongside stronger predictors suggest a clear hierarchy among experiential determinants of behavioural intention.

From a theoretical standpoint, the study extends experiential tourism and sustainability frameworks by foregrounding authenticity and environmental consciousness as central mechanisms driving loyalty in agro-cultural festival contexts. Practically, the findings provide clear guidance for event organisers to prioritise authentic cultural programming and to embed sustainability practices and messaging throughout festival design. For policymakers, the results reinforce the importance of supporting initiatives that preserve cultural integrity and promote environmental stewardship within rural tourism ecosystems.

Despite its contributions, this study has several limitations. First, the cross-sectional research design restricts causal inference and limits the ability to capture changes in visitors' perceptions and behaviours over time. Future research could adopt longitudinal designs or larger sample sizes to examine the stability and evolution of these relationships. Second, the reliance on self-reported data may introduce common method bias, despite efforts to minimise its effects. Incorporating behavioural data or multi-source measurement approaches would strengthen the validity of future findings.

Third, the study focused on a single experiential agrotourism festival, which constrains the generalisability of the results to other rural tourism contexts. Replication across different geographical locations, festival formats, or agrotourism settings is therefore recommended. In addition, the presence of relatively high multicollinearity between certain experiential constructs may have reduced the clarity of individual predictor effects. Future studies could employ advanced analytical techniques or mixed-methods approaches to better disentangle overlapping dimensions. Finally, subsequent research may explore additional mediators or moderators such as satisfaction, cultural learning, or demographic characteristics to develop a more comprehensive understanding of behavioural intention in experiential agrotourism.

Overall, agrotourism festivals such as Festival Xplorasa are most successful when they transcend entertainment-focused models to deliver culturally grounded and environmentally responsible experiences that generate enduring psychological engagement and behavioural commitment.

Acknowledgement

The authors sincerely extend their appreciation to Selangor State Government for supporting this project through the Tourism Selangor Grant 2025 (Grant Code: GPB/02-UNISEL-23/SS/10).

References

- Abdelghani, A. A. A., Mohammed, M. A., & Ahmed, H. A. M. (2025). Cairo's call: Exploring the role of cultural identity and behavioural intentions in promoting Islamic heritage tourism in Egypt. *The International Journal of Tourism and Hospitality Studies*, 9(2), 132-157. <https://doi.org/10.21608/ijthsx.2025.409545.1177>
- Abhirami, K. S., & Vineeth, K. M. (2025). Antecedents and outcomes of memorable festival tourism experiences. *Asian Journal of Management*, 16(2). <https://doi.org/10.52711/2321-5763.2025.00018>
- Aditya, M. K., Arafah, W., Rahmanita, M., & Mariati, S. (2023). The effect of destination image and visitor experience towards behavioural intentions at rice field agritourism. *Proceedings of 4th International Conference on Tourism, Gastronomy, and Tourist Destination (TGDIC 2023)*. https://doi.org/10.2991/978-94-6463-296-5_25
- Ajzen, I. (1991). The theory of planned behaviour. *Organizational Behaviour and Human Decision Processes*, 50(2), 179-211. [https://doi.org/10.1016/0749-5978\(91\)90020-t](https://doi.org/10.1016/0749-5978(91)90020-t)
- Akmar Annuar. (2024, December 22). *Surprising Selangor: A grand start to a year of tourism excellence*. *The Malaysian Reserve*. <https://themalaysianreserve.com/2024/12/22/surprising-selangor-a-grand-start-to-a-year-of-tourism-excellence/>
- Bag, S., Ray, N., & Banerjee, B. (2021). The moderating role of experiential satisfaction. *Journal of Services Marketing*, 35(2), 201-214. <https://doi.org/10.1177/23197145211052817>
- Bakr, A. A., Ali, E. R., Aljurayyad, S. S., Fathy, E. A., & Fouad, A. M. (2025). From authenticity to sustainability: The role of authentic cultural and consumer knowledge in shaping green consumerism and behavioural intention to gastronomy in heritage restaurants in Hail, Saudi Arabia. *Sustainability*, 17(8), 3530. <https://doi.org/10.3390/su17083530>
- Barbieri, C. (2013). Assessing the sustainability of agritourism in the US: a comparison between agritourism and other farm entrepreneurial ventures. *Journal of Sustainable Tourism*, 21(2), 252-270. <https://doi.org/10.1080/09669582.2012.685174>
- Best, J. & Kahn, J. (1977). *Research in education* (9th ed.). University of Illinois.
- Business Today Editorial. (2025, July 2). *State launches RM300,000 grant to boost tourism*. <https://www.businesstoday.com.my/2025/07/02/state-launches-rm30000-grant-to-boost-tourism/>
- Chen, C.-F., & Tsai, D. (2007). How destination image and evaluative factors affect behavioural intentions? *Tourism Management*, 28(4), 1115-1122. <https://doi.org/10.1016/j.tourman.2006.07.007>
- Chen, G. (2025, May 31). Turning Selangor farms into tourist attractions. *The Star Online*. <https://www.thestar.com.my/metro/metro-news/2025/06/24/turning-selangor-farms-into-tourist-attractions>
- Dangi, V. K. (2018). Agritourism as a catalyst for sustainable rural development. *International Journal of Social Sciences and Rural Development*, 8(1), 12-25. <https://doi.org/10.47814/ijssrr.v8i7.2798>
- Davidović, J., Pantović, D., & Mićović, A. (2025). Agritourism as a catalyst for sustainable rural development: A literature review. *The European Journal of Applied Economics*, 22(2), 99-117. <https://doi.org/10.5937/ejae22-57241>

- Dina, R. F., Djoko, K., Budi, S., & Wahib, M. A. (2019). Determinants of behavioural intention in agrotourism visiting. *Russian Journal of Agricultural and Socio-Economic Sciences*, 3(87), 305-311. https://rjoas.com/issue-2019-03/article_36.pdf
- Do, V. P. & Nguyen, V. N. (2025). Evaluating the role of authenticity and sustainability in shaping visitor experiences in farm-to-table agritourism. *Geojournal of Tourism and Geosites*, 59(2), 650-660. <https://doi.org/10.30892/gtg.59212-1444>
- Ferdiyanti, N. C., Trisnawati, J. D., & Rahayu, S. (2025). The Influence of motivation and tourist loyalty on interest in visiting agro-tourism. *Jurnal Ilmiah Manajemen Kesatuan*, 13(2), 746–756. <https://doi.org/10.37641/jimkes.v13i3.3117>
- Gao, J., Kim, M. C., Tze, H. T., Ding, P. C., Yu, S. Q., & Zhu, Y. (2023). Understanding the ecotourism behavioural intention by expanding the theory of planned behaviour. *Environment-Behaviour Proceedings Journal*, 8(26), 427–434. <https://doi.org/10.21834/e-bpj.v8i26.5159>
- Ge, H. & Chen, X. (2024). Research on tourist satisfaction and behavioural intention in ecological tourism health tourism activities in Bama, Guangxi based on structural equation model. *GeoJournal of Tourism and Geosites*, 52(1), 1198-1210. <https://gtg.webhost.uoradea.ro/PDF/GTG-1-2024/gtg.52121-1198.pdf>
- Getz, D., & Page, S. J. (2024). *Event tourism: Concepts, international case studies, and research*. Routledge.
- Hadinejad, A., Esfandiari, K., & Skavronskaya, L. (2025). Advancing sustainable tourism behavioural research. *Current Issues in Tourism*, 1-20. <https://doi.org/10.1080/13683500.2025.2512999>
- Han, H., Hsu, L.-T. J., & Sheu, C. (2010). Application of the theory of planned behaviour to green hotel choice: Testing the moderating effects of environmentally friendly behaviours. *Tourism Management*, 31(3), 325-334. <https://doi.org/10.1016/j.tourman.2009.03.013>
- Hai Ha, L. T., & Thuy Van, P. T. (2023). Determinants influencing the loyalty of agritourism destinations to tourists. *Journal of Economics, Finance and Management Studies*, 06(05), 2314-2321. <https://doi.org/10.47191/jefms/v6-i5-52>
- He, L., & Timothy, D. J. (2024). Authentic or comfortable? What tourists want in the destination. *Frontiers in Sustainable Tourism*, 3. <https://doi.org/10.3389/frsut.2024.1437014>
- Jaunis, O., Mojiol, A. R., & Kodoh, J. (2022). Agrotourism in Malaysia: A Review on concept, development, challenges and benefits. *Transactions on science and technology*, 9(2), 77-85. <https://tost.unise.org/pdfs/vol9/no2/ToST-9x2x77-85xRA.pdf>
- Kim, H., & Jamal, T. (2007). Touristic quest for existential authenticity. *Annals of Tourism Research*, 34(1), 181–201. <https://doi.org/10.1016/j.annals.2006.07.009>
- Kim, J.-H., Ritchie, J. B., & McCormick, B. (2012). Development of a scale to measure memorable tourism experiences. *Journal of Travel Research*, 51(1), 12-25. <https://doi.org/10.1177/0047287510385467>
- Kolb, D. A. (1984). *Experiential learning: Experience as the source of learning and development*. Prentice-Hall.
- Liang, A. R.-D., Hsiao, T.-Y., Chen, D.-J., & Lin, J.-H. (2021). Agritourism: Experience design, activities, and revisit intention. *Tourism Review*, 76(5), 1181-1196. <https://doi.org/10.1108/tr-10-2019-0438>

- MacCannell, D. (1973). Staged authenticity: Arrangements of social space in tourist settings. *American Journal of Sociology*, 79(3), 589–603. <https://doi.org/10.1086/225585>
- Malay Mail. (2025, September 6). *Selangor to complete up to five recreational parks by end-2025, says state exco*. <https://www.malaymail.com/news/malaysia/2025/09/06/selangor-to-complete-up-to-five-recreational-parks-by-end-2025-says-state-exco/12345>
- Martinus, K., Boruff, B., & Nunez Picado, A. (2024). Authenticity, interaction, learning and location as curators of experiential agritourism. *Journal of Rural Studies*, 108, 103294. <https://doi.org/10.1016/j.jrurstud.2024.103294>
- Nguyen, N. V. (2025). Bibliometric analysis of the theory of planned behaviour and its role in sustainable tourism. *Cogent Social Sciences*, 11(1), 1–29. <https://doi.org/10.1080/23311886.2025.2573158>
- Nor Ziana Mohd Uzir (2024). Best practices and challenges of farm tourism in Malaysia. *The FFTC Journal of Agricultural Policy*, 6, 50-59. <https://doi.org/10.56669/wehv5336>
- O'Brien, R. M. (2007). A caution regarding rules of thumb for variance inflation factors. *Quality & Quantity*, 41, 673–690. <https://doi.org/10.1007/s11135-006-9018-6>
- Oliver, R.L. (1997). *Satisfaction: A Behavioral Perspective on the Consumer*. The McGraw-Hill Companies, Inc., New York.
- Pine, B. J., & Gilmore, J. H. (1999). *The experience economy: Work is theatre & every business a stage*. Harvard Business School Press.
- Ray, N. (2013). Factors Influencing tourists' motivational determinants for promotion of tourism destination: An empirical assessment on rural tourism with special reference from Kamarpukur, West Bengal. In *Interdisciplinary Perspectives on Business Convergence, Computing, and Legality* (pp. 26-35). IGI Global.
- Richards, G. (2018). Cultural tourism: A review of recent research and trends. *Journal of Hospitality and Tourism Management*, 36, 12–21. <https://doi.org/10.1016/j.jhtm.2018.03.005>
- Sangnak, D., Poo-Udom, A., Tamnanwan, P., Kongduang, T., & Chanthothai, S. (2025). Agritourism as a catalyst for sustainable rural development: Innovations, challenges, and policy perspectives in the post-COVID-19 era. *Journal of Infrastructure, Policy and Development*, 9(1), 11185. <https://doi.org/10.24294/jipd11185>
- Selangor.Travel. (2023, January 20). Empowering agrotourism in Selangor through community-based tourism activities. *Tourism Selangor*. <https://selangor.travel/empowering-agrotourism-in-selangor-through-community-based-tourism-activities>
- United Nations World Tourism Organization. (2022). *Global report on tourism and sustainability (UNWTO Report)*. <https://www.unwto.org/global-report-on-tourism-and-sustainability>
- Wang, M., Cao, K., Khan, N. M., Zhao, Y., Dong, F., & Hu. X. (2025). Relationship between perceived value of rural tourism and behavioural intention. *Journal of Travel & Tourism Marketing*, 1-31. <https://doi.org/10.1080/1528008X.2025.2464167>
- Wang, N. (1999). Rethinking authenticity in tourism experience. *Annals of Tourism Research*, 26(2), 349–370. [https://doi.org/10.1016/s0160-7383\(98\)00103-0](https://doi.org/10.1016/s0160-7383(98)00103-0)
- Weaver, D. (2015). *Sustainable tourism: Theory and practice*. Routledge.

- Yang, P., Liu, Y., Xiong, R., Run, P., & Junaidi, J. (2025). The emotional impact of cultural tourism: tourist cultural attributes and delight. *Tourism Recreation Research*, 1–15. <https://doi.org/10.1080/02508281.2025.2493165>
- Yoon, Y., & Uysal, M. (2005). An examination of the effects of motivation and satisfaction on destination loyalty: a structural model. *Tourism Management*, 26(1), 45–56. <https://doi.org/10.1016/j.tourman.2003.08.016>
- Zeithaml, V. A. (1988). Consumer perceptions of price, quality, and value: A means-end model and synthesis of evidence. *Journal of Marketing*, 52(3), 2–22. <https://doi.org/10.1177/002224298805200302>
- Zhang, G., Chen, X., Law, R., & Zhang, M. (2020). Sustainability of heritage tourism: A structural perspective from cultural identity and consumption intention. *Sustainability*, 12(21), 9199. <https://doi.org/10.3390/su12219199>
- Zhang, S.-N., & Deng, F. (2022). Innovation and authenticity: Constructing tourists' subjective well-being in festival tourism. *Frontiers in Psychology*, 13, 950024. <https://doi.org/10.3389/fpsyg.2022.950024>
- Zhang, Y., Zhao, H., & Zaman, U. (2025). Eco-consciousness in tourism: A psychological perspective on green marketing and consumer behaviour. *Acta Psychologica*, 255, 104951. <https://doi.org/10.1016/j.actpsy.2025.104951>
- Zhao, J., Shida Irwana Omar, Liu, H. & Wen, Q. (2025). Examining the effects of perceived value on behavioural intention of green tourists in Hulunbuir Grassland, China. *Planning Malaysia*, 23(37). <https://doi.org/10.21837/pm.v23i36.1752>
- Zhenbin, W., Ramachandran, S., Siow, M., Subramaniam, T., & Hui, Z. (2024). Exploring the formation of behavioral intention toward rural tourism via sensory experience and memorable tourism experiences, a case study in Henan, China. *Journal of Quality Assurance in Hospitality & Tourism*, 1-25. <https://doi.org/10.1080/1528008x.2024.2390493>
- Zhou, G., Chen, W., & Wu, Y. (2022). Research on the effect of authenticity on revisit intention in heritage tourism. *Frontiers in Psychology*, 13. <https://doi.org/10.3389/fpsyg.2022.883380>
- Zhou, J., Wang, Y., Wang, Y., & Miao, H. (2025). Destination authenticity as a halo? Enhancing emotional solidarity with residents in rural tourism. *PLOS One*, 20(9), e0331644. <https://doi.org/10.1371/journal.pone.0331644>
- Zhu, N., Xu, H., Zhang, X., & Chen, L. (2025). A study on the influence of rural tourism's perceived destination restorative qualities on loyalty based on SOR model. *Frontiers in Psychology*, 16, 1529686. <https://doi.org/10.3389/fpsyg.2025.1529686>