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CONCEPTUALISING SMART COMMUNITY-BASED TOURISM FOR WOMEN-LED RURAL ENTERPRISES IN MALAYSIA

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Abstract:

Smart Community-Based Tourism (CBT) remains an emerging area of inquiry, particularly within rural, women-led tourism enterprises. Existing tourism literature remains conceptually fragmented: macro-level Smart Tourism models focus on urban, infrastructure-heavy destinations; CBT models emphasise local values without conceptualising digital integration; and sustainability frameworks operate as detached outcome layers. Informed by a Social Constructivist paradigm and by a Socio-Technical Systems perspective, this conceptual paper develops a context-specific Smart CBT Framework tailored to rural women-led enterprises. The paper synthesises three core analytical components: accessible digital tools and technologies (the technical subsystem), core CBT practice domains (the social subsystem) and the Triple Bottom Line as an evaluative outcome layer. By positioning Socio-Technical Alignment as the central mediating mechanism, the framework conceptualises Smart CBT (adapted CBT practices) not as a macro-level technological deployment, but as situated operational routines that emerge when women entrepreneurs adapt digital tools to fit community routines and resource constraints. The resulting framework provides a practice-oriented perspective that reframes digitalisation as a process of social inclusion and joint optimization rather than purely technical innovation. This paper provides a theoretical basis for future empirical inquiry while suggesting context-sensitive pathways for rural digital inclusion and gender-responsive tourism policy in Malaysia.

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Introduction

Women-led Community-Based Tourism (CBT) enterprises in rural Malaysia are increasingly operating in a tourism environment shaped by digitalisation, changing visitor expectations and growing demands for sustainability. However, the conceptual tools used to examine these enterprises remain fragmented. Smart Tourism models, CBT principles and sustainability frameworks are well established in tourism research, but they tend to address different aspects of tourism development rather than provide a coherent basis for understanding the operational realities of women-led CBT enterprises in rural settings. This lack of conceptual clarity makes it difficult to examine how digital adoption takes place within CBT environments and, from a practical perspective, how digital transformation in rural tourism can be understood and supported.

Smart Tourism models, for example, explain how digital technologies can contribute to tourism ecosystems (Gretzel et al., 2023; Sedarati et al., 2022). Much of this thinking, however, has developed around urban or technologically advanced destinations. Such assumptions about connectivity, digital literacy and institutional capacity may not reflect the circumstances in which women-led rural enterprises operate. CBT offers another perspective, but with a different concern. The CBI principles (CBI, 2023) are established in community values and practices, however, digitalisation is not part of their conceptualisation. They therefore offer little explanation of what happens to established CBT practices when digital tools are introduced into routine activities. This leaves an unresolved connection between the two bodies of knowledge. Smart Tourism explains the digital dimension, while CBT explains the community dimension, but the interaction between technology and existing community values, norms and practices remain less clear.

The same uncertainty can be found in the developing Smart CBT literature. Smart CBT has yet to acquire a commonly accepted definition, scope or analytical structure (Azmi & Ahmad, 2022). Digitalisation is interpreted differently across studies, as are community participation and sustainability. As a result, studies labelled as Smart CBT may not necessarily be examining the same phenomenon or approaching it in comparable ways. This becomes particularly important in the case of women-led enterprises in rural areas. Digital practices in these settings may be introduced gradually, shaped by local circumstances and fitted around established ways of organising CBT activities. An analytical approach that overlooks this process would reveal little about how digitalisation takes place in practice.

Journal of Tourism, Hospitality and Environment Management
JTHEM
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Sustainability adds another dimension to this conceptual problem. The Triple Bottom Line (TBL) provides the familiar economic, socio-cultural and environmental dimensions used in sustainable tourism research (Ministry of Economy, 2023; Uslu et al., 2020). However, these dimensions tend to remain separate from the way Smart Tourism and CBT are conceptualised. This makes it difficult to consider whether, and in what ways, digitally adapted CBT practices contribute to the longer-term sustainability of women-led rural enterprises. The conceptual connection between digital practices, CBT principles and sustainability outcomes therefore remains insufficiently developed.

A framework for women-led Smart CBT needs to address these connections rather than treat digitalisation, community-based practice and sustainability as separate concerns. It must also recognise that digital adoption in rural CBT is situated and practice-based and may therefore take different forms depending on the conditions in which women-led enterprises operate.

This paper addresses this need by proposing a preliminary Smart CBT Conceptual Framework informed by a Socio-Technical Systems (STS) perspective specifically for women-led rural CBT enterprises. Digitalisation is conceptualised through the joint optimisation and interaction between technical tools and social structures, bringing together key ideas from Smart Tourism, CBT principles and sustainability research. The resulting framework provides a unified conceptual lens for future empirical research and a clearer understanding of digitalisation in women-led CBT enterprises. Its focus on rural Malaysia also extends Smart Tourism discussions beyond infrastructure-rich settings to the resource and institutional conditions found in many developing tourism contexts. The framework is also evaluated against Malaysia's current rural digital inclusion and gender-equity policy directions.

Theoretical Basis

Rural women-led CBT enterprises increasingly encounter digital expectations as tourism becomes a more technologically mediated practice. Understanding how these enterprises engage with digital tools requires an evaluation of both theoretical perspectives and practical frameworks, as existing approaches offer partial insights when considered individually. Middle-range theories provide conceptual guidance on aspects of adoption, innovation, institutional dynamics and gender empowerment (see: Cheng & Cho, 2010; Law et al., 2023), but their explanatory power remains limited when applied to the operational realities of rural community-based contexts. From this standpoint, several widely used theories offer only a partial fit:

Technology Acceptance Model (TAM):

TAM explains technology adoption mainly through individual users' cognitive perceptions of usefulness and ease of use (Kim et al., 2008). While valuable for describing how acceptance is framed in technology-rich environments (Cheng & Cho, 2010; Kim et al., 2008), TAM's focus on individual appraisal fails to capture rural CBT settings where digital practices are collective, socially embedded and constrained by local norms and resources, especially among women-led enterprises (Mogaji et al., 2024). TAM helps situate adoption debates but cannot explain how smart practices are negotiated within community contexts (Law et al., 2023; Mogaji et al., 2024).

Journal of Tourism, Hospitality and Environment Management
JTHEM
EISSN: 0128-178X
Volume 11 Issue 45 (September 2026) PP. 860-876

***Diffusion of Innovation (DOI) Theory*:**

DOI provides a structured account of how innovations spread through social systems via adopter categories and diffusion sequences over time (Kee, 2017; Zhu, 2022). However, this study does not trace diffusion rates or classify adopters; instead, it examines how women work with locally available digital tools to meet community priorities. DOI's underlying assumptions regarding infrastructural readiness and smooth transferability limit its explanatory value in low-resource rural environments (Fahmi & Arifianto, 2021; Fanelli, 2021; Lyytinen & Damsgaard, 2001).

***Institutional Theory*:**

Institutional theory foregrounds coercive, mimetic and normative pressures exerted by external institutions (such as regulatory bodies or industry standards). While useful for examining macro-level compliance, institutional theory offers limited insight into the micro-level, informal workarounds and incremental adaptations that rural women entrepreneurs deploy to overcome local resource constraints on a daily basis.

Empowerment Theory:

Empowerment theory foregrounds agency, participation, self-efficacy and leadership, offering important insights into gendered community dynamics and women's decision-making visibility (Christens, 2011; Menon & Allen, 2020; Niewoehner-Green et al., 2019). However, treating empowerment primarily as a psychological state or social outcome does not provide an integrated mechanism to interpret how specific digital practices interact directly with sustainability directions in Smart CBT (Kusumastuti et al., 2024; Montero et al., 2022). Empowerment thus serves as a sensitising background perspective rather than the primary analytical engine.

Gender and Development (GAD) Theory:

GAD theory critically examines structural gender relations, systemic inequalities, power dynamics and the gendered division of labour within socio-economic structures. While GAD provides essential context regarding women's unpaid care work, household responsibilities and resource access constraints in rural areas, it treats gender dynamics primarily through a socio-political lens. Consequently, GAD lacks explicit analytical tools to account for how technical affordances such as digital platform interfaces, connectivity limitations or device constraints, directly intersect with operational feasibility and sustainability outcomes.

In contrast, STS perspective, informed by a social constructivist paradigm, aligns directly with this study's interpretive purpose. Social constructivism asserts that the significance of both technologies and tourism practices arises not from fixed properties, but from their continuous interaction with local cultural norms, skills, resources and community expectations (Hunter et al., 2015; Schrader, 2015). Applying an STS lens operationalises this constructivist view by framing digitalisation in rural CBT as a process of joint optimisation between two interdependent subsystems: (1) The Technical Subsystem: Digital tools, platforms, network infrastructure and data workflows and (2) The Social Subsystem: Community structures, cultural values, gendered work routines and local governance arrangements.

Journal of Tourism, Hospitality and Environment Management
JTHEM
EISSN: 0128-178X
Volume 11 Issue 45 (September 2026) PP. 860-876

From this lens, digitalisation in rural CBT is understood as a socially negotiated process where women-led enterprises adapt and co-create Smart CBT practices that are culturally appropriate, operationally feasible and oriented toward sustainability (Nambisan, 2017; Silalahi et al., 2025; Verma, 2024). This framing allows the research to read "smartness" as a socio-technical practice-in-context, rather than as individual acceptance, diffusion path, institutional compliance or isolated empowerment outcome.

Models and Frameworks

Several conceptual frameworks have been used to examine technology, community engagement and sustainability in tourism. One of these is the Sustainable Livelihoods Framework (SLF), which focuses on economic resilience and access to resources, particularly how rural households respond to vulnerability and diversify their sources of income (Anadozie et al., 2019; Bvuma & Marnewick, 2020). This makes the SLF useful for examining adaptive capacity and livelihood strategies, although its broad and complex structure has also been criticised (Anadozie et al., 2019). Its relevance becomes less straightforward when the focus shifts to digitalisation in tourism. Technological change now occurs alongside social, cultural and environmental concerns, yet conventional frameworks such as the SLF provide limited direction for understanding how digital tools become integrated into these processes (Gretzel et al., 2015; Park et al., 2023). More importantly for this study, the SLF is primarily concerned with livelihoods at the household level, whereas the present research examines digital practices embedded within community-based tourism activities. The framework remains useful for understanding resilience and the economic conditions surrounding community livelihoods, but it does not fully capture the digital and multidimensional sustainability concerns central to this study. This limitation has contributed to calls for complementary approaches that give greater attention to digital transformation and the wider dimensions of sustainability in tourism development (Gretzel et al., 2015; Park et al., 2023).

A different perspective is offered by the Innovation Systems Model. Rather than focusing on household livelihoods, this model considers how institutions, networks and technological change interact in the development and diffusion of innovation (Markard et al., 2015; Rohe & Mattes, 2022). It is particularly useful for explaining how innovation develops and moves across interconnected actors and sectors, as demonstrated in research on regional innovation and technological diffusion (Tsai & Chang, 2016). The conditions assumed by the model, however, are not necessarily those found in women-led CBT enterprises in rural areas. Innovation systems commonly depend on institutional support, established networks and enabling infrastructure, while these conditions may be limited or uneven in rural CBT settings. Locally developed practices may consequently operate without the formal institutional support needed to realise the processes anticipated by the model, which reduces its suitability for explaining this particular context (Uyarra & Flanagan, 2010).

Community Capitals Frameworks shift the emphasis again, this time towards the resources and strengths that exist within communities. They recognise multiple forms of capital, including social, cultural, human, financial, political and built capital, and are therefore useful for examining community capacity and cohesion (Kline et al., 2018; Qian et al., 2019). A key strength of this approach lies in its ability to highlight collective action and the role of social networks in fostering community development and resilience, as demonstrated by studies in tourism contexts where robust social capital has been linked to successful community-based tourism initiatives and sustainable development outcomes (Suryandhani et al., 2023). However,

Journal of Tourism, Hospitality and Environment Management
JTHEM
EISSN: 0128-178X
Volume 11 Issue 45 (September 2026) PP. 860-876

several scholars argue that these traditional frameworks in tourism often overlook the integration of digital technologies, even though these tools have become essential in shaping technology-enabled tourism initiatives. Recent studies further show that this omission limits the frameworks' ability to address rapid digital transformation in rural tourism, where adapting to emerging ICT trends and technology-driven visitor behaviours is now critical (Kuzman et al., 2024; Vu et al., 2025), while giving limited attention to environmental outcomes (Astutik et al., 2025; Sharath & Cunha, 2025).

Smart Tourism Ecosystem (STE) Model illustrates the evolutionary transformation of traditional tourism into a technology-enabled ecosystem through digital enablers, data flows, and usage dynamic (Gretzel et al., 2015; Sedarati et al., 2022; Thai, 2023). While STE effectively maps macro-level destination technology potential and collaborative value co-creation (Liburd et al., 2017; Ye et al., 2020), its architecture relies heavily on high-level system pillars and urban infrastructures rather than micro-level operational actions. Consequently, while STE establishes the baseline logic for how traditional tourism becomes digitally enabled, it provides limited guidance on how rural micro-enterprises negotiate, adapt and operationalise simple digital tools within day-to-day community routines.

Table 1 provides a comparative summary of these frameworks, highlighting how STE serves as a baseline model for macro-level digital transformation while demonstrating the necessity of moving toward a practice-oriented Smart CBT framework tailored to micro-level rural enterprises.

Table 1: Comparative Summary of Conceptual Frameworks and Their Relevance to Rural Women-Led Smart CBT

Model/ Framework	Conceptual Focus	Strengths	Limitations	Relevance to Rural Women-Led CBT
Sustainable Livelihoods Framework (SLF)	Resource access, economic resilience *(Anadozie et al., 2019; Bvuma & Marnewick, 2020)*	Captures adaptive capacity and livelihood diversification *(Anadozie et al., 2019)*	Limited guidance on digital practices; minimal focus on socio-cultural or environmental sustainability (Gretzel et al., 2015; Park et al., 2023)	Economic perspective useful but incomplete for Smart CBT (Gretzel et al., 2015; Park et al., 2023)
Innovation Systems Model	Institutional and network interactions for innovation *(Markard et al., 2015; Rohe & Mattes, 2022)*	Explains systemic innovation processes and adoption dynamics *(Tsai & Chang, 2016)*	Assumes institutional capacity and infrastructure; less suited to rural, low-resource contexts *(Uyarra & Flanagan, 2010)*	Limited; provides innovation lens but lacks contextual fit *(Uyarra & Flanagan, 2010)*

Journal of Tourism, Hospitality and Environment Management
JTHEM
EISSN: 0128-178X
Volume 11 Issue 45 (September 2026) PP. 860-876

Community Capitals Framework	Social, cultural, human, financial capital (Kline et al., 2018; Qian et al., 2019)	Highlights socio-cultural cohesion and community strengths *(Suryandhani et al., 2023)*	Limited integration of digital technologies; environmental dimension underdeveloped *(Astutik et al., 2025; Kuzman et al., 2024; Sharath & Cunha, 2025; Vu et al., 2025)*	Strong socio-cultural lens but insufficient for Smart CBT analysis *(Kuzman et al., 2024; Vu et al., 2025)*
Smart Tourism Ecosystem (STE)	Digital enablers across tourism domains; transformation of traditional tourism into a smart ecosystem (Gretzel et al., 2015; Sedarati et al., 2022; Thai, 2023)	Maps destination-wide technology potential data flows and collaborative value co-creation *(Liburd et al., 2017; Ye et al., 2020)*	Urban-centric; focuses on macro ecosystem principles rather than micro operational practices (Gretzel et al., 2015)	High baseline relevance; illustrates the core transition from traditional to digital tourism, but requires adaptation to fit granular, micro-level CBT practices (Gretzel et al., 2015; Thai, 2023)
Triple Bottom Line (TBL)	Economic, socio-cultural, environmental sustainability *(Dwyer, 2005; Fridriksson et al., 2020; Lesar et al., 2019; Wondirad et al., 2022)*	Provides holistic sustainability assessment *(Dwyer, 2005; Fridriksson et al., 2020)*	Does not guide operational practices or digital adoption *(Lesar et al., 2019; Wondirad et al., 2022)*	Highly relevant; structured lens for evaluating outcomes *(Lesar et al., 2019; Mogaji et al., 2024; Wondirad et al., 2022)*

Methodology

Development of the conceptual framework draws on an integrative synthesis of theory and literature across Smart Tourism, CBT and sustainability research. The conceptual-theoretical design guiding this research positions understanding before interpretation. Rather than treating Smart Tourism, CBT principles or sustainability as fixed or universal frameworks, the approach examines how their key ideas can be brought into dialogue to illuminate women-led rural tourism enterprises. This form of research advances knowledge by reorganising and interpreting existing scholarship, allowing concepts drawn from different domains to be

Journal of Tourism, Hospitality and Environment Management
JTHEM
EISSN: 0128-178X
Volume 11 Issue 45 (September 2026) PP. 860-876
realigned in ways that reveal new relationships, tensions and possibilities (Dangi & Jamal, 2016).

The research approach is explicitly conceptual, building insight through the synthesis of diverse literatures to develop a coherent analytical lens for exploring digitalisation, community participation and sustainability in rural Malaysia (Kuntariningsih et al., 2023; Pasanchay & Schott, 2021). It incorporates key theoretical perspectives to clarify how these concepts operate and interrelate within the Malaysian rural tourism context. By engaging with foundational perspectives, the design deliberately refrains from testing conventional hypotheses; instead, it explores how these theories can deepen understanding of Smart CBT practices when considered through a social constructivist perspective (Efthymiadou & Farmaki, 2023).

From a constructivist standpoint underpinned by STS thinking, Smart CBT is not viewed merely as a technical deployment or macro system model, but as an emergent set of practices negotiated by women entrepreneurs, community members and local stakeholders. Digital tools take shape through interpretation; sustainability acquires significance through lived priorities; and CBT principles evolve as communities respond to changing tourism environments. A conceptual- theoretical design is therefore essential for capturing these interrelationships, as it allows the framework to remain sensitive to local interpretation while informed by established scholarship, which facilitates a deeper understanding of the complexities surrounding CBT (Azwar et al., 2023; Mukti & Rofiah, 2024; Somnuek, 2018).

Developing the Smart CBT framework drew on literature across three interconnected bodies of work: Smart Tourism and digital ecosystem studies, CBT scholarship and research on women-led rural tourism enterprises. Sources were prioritised for their capacity to illuminate rural operational realities, community participation and sustainability across economic, socio-cultural and environmental dimensions. Particular attention was given to Malaysian and wider ASEAN scholarship, since these discussions provide the contextual grounding required for interpreting women's roles and digital practices within locally specific tourism settings. The search therefore aimed for interpretive breadth rather than exhaustive coverage, seeking studies that offer strong conceptual insight into how technology, community values and sustainability concerns are articulated in rural tourism contexts.

The selected literature was then synthesised through iterative, comparative reading across the three domains using an STS analytical lens. Rather than treating digitalisation, CBT practices and sustainability as parallel conversations, their key ideas were placed in dialogue to surface alignments, tensions and openings for integration. Digital practices such as storytelling platforms, mobile booking and coordination tools were interpreted as situated expressions of "smartness," negotiated through local resource conditions, community expectations and gendered norms of participation. Concepts were subsequently clustered to clarify how digital tools intersect with core CBT practice domains to generate adapted Smart CBT practices, with the TBL providing the evaluative layer for sustainability implications. This process produced an integrated framing of Smart CBT as a socio-technical practice-space where technology, community dynamics and sustainability commitments co-emerge within everyday rural, women-led tourism realities, forming the conceptual basis for the framework presented in the next section.

Journal of Tourism, Hospitality and Environment Management
JTHEM
EISSN: 0128-178X
Volume 11 Issue 45 (September 2026) PP. 860-876

Conceptual Development

The framework was developed in stages. It begins with an existing model of digital transformation in tourism, considers where that model becomes less suitable for rural CBT, and then moves towards a practice-based interpretation informed by STS theory.

The starting point is the Smart Tourism Ecosystem (STE) model by Sedarati et al. (2022), as illustrated in Figure 1. The model is useful because it explains the transition from conventional tourism towards a digitally enabled tourism ecosystem. Digital tools, including mobile applications, online booking systems, messaging platforms and basic forms of data exchange, enable interactions between different tourism actors. This provides a useful basis for the present study. In contrast to earlier smart city thinking centred on large-scale urban technologies, the STE model shows how technology can change the way conventional tourism activities are carried out.

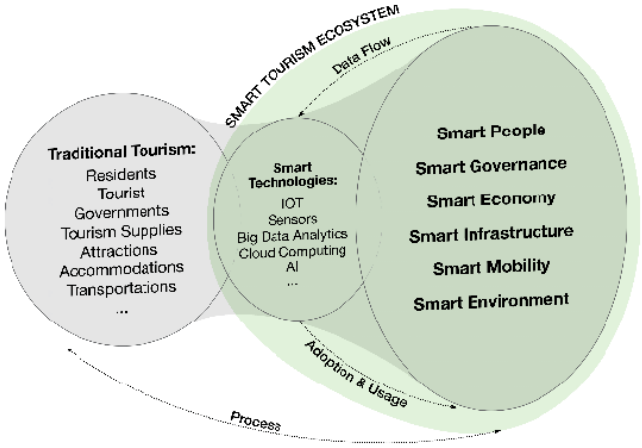


Figure 1: Smart Tourism Ecosystem

Source: Adopted from Sedarti et al, (2022)

The difficulty is that the STE model largely explains smart tourism at the destination or ecosystem level. Its emphasis is therefore on broader system elements, such as smart governance and smart mobility, together with the movement of data across the tourism ecosystem. This scale does not fully correspond with the realities of women-led CBT enterprises in rural areas. For these enterprises, digitalisation is more likely to take place through ordinary operational decisions and routines than through sophisticated ecosystem architecture or formal institutional arrangements. A macro-level explanation alone therefore tells us relatively little about how a rural micro-enterprise decides which technologies are useful, adapts them to existing practices and continues to use them despite limited resources. The present study consequently brings the analysis down to the level of everyday CBT practice.

Building the Inputs: Social and Technical Subsystems

The social side of the framework is represented by eight CBT practice domains: cultural heritage preservation, ecological conservation, community governance, community-owned enterprise management, local product development, stakeholder collaboration, tourism service management and benefit distribution (Kuntariningsih et al., 2023; Pasanchay & Schott, 2021). These domains capture what CBT communities actually do, including the routines through

Journal of Tourism, Hospitality and Environment Management
JTHEM
EISSN: 0128-178X
Volume 11 Issue 45 (September 2026) PP. 860-876
which tourism is organised, local priorities are maintained and community interests are managed.

The Technical Subsystem is considered alongside these practices. Here, the emphasis is not on sophisticated smart-city infrastructure, such as automated AI systems or IoT grids, but on technologies that are accessible enough to be used in routine rural enterprise activities. These may include social media, mobile messaging, e-payment facilities, digital navigation and simple online review mechanisms. Placing the technical and social elements together is important because the use of technology cannot be separated from the activity in which it is used. A messaging platform, for instance, only becomes relevant to CBT when it is considered in relation to activities such as coordinating visitors, managing bookings or communicating among community members.

The presence of both elements, however, does not mean that digital transformation will necessarily occur. What matters is whether a particular technology can work within the social and operational conditions of the enterprise. STS theory is used here to explain this relationship through Socio-Technical Alignment, referring to the fit between what a technology allows and what is feasible within the local setting. For women-led rural enterprises, that fit may depend on digital literacy, available time, financial resources, connectivity, household responsibilities and community governance arrangements. A tool that fits these conditions can become part of routine operations. Where the fit is poor, its use may remain limited, fragmented or difficult to sustain.

Establishing "Smart CBT" as Adapted CBT Practices

Smart CBT emerges from this interaction between digital tools and existing CBT practices. It is therefore not treated as a separate model in which technology takes precedence over community tourism. In this study, Smart CBT refers to CBT practices that have been adapted, where appropriate, through the use of digital tools. This could be as straightforward as handling homestay bookings through WhatsApp, promoting traditional crafts through social media, accepting local payments through QR codes or communicating conservation guidance digitally. What makes these practices “smart” is consequently not the sophistication of the technology itself, but how appropriately and feasibly it is incorporated into the way the enterprise operates.

Positioning TBL as the Evaluative Outcome Layer

To evaluate what adapted Smart CBT practices achieve over time, the framework incorporates the TBL model (Elkington, 2018; Hieu & Nwachukwu, 2019; Stoica, 2024). TBL supplies the evaluative outcome layer across three interdependent dimensions: (1) Economic Sustainability: Viable income generation, direct market access, reduced leakage and enterprise resilience. (2) Socio-Cultural Sustainability: Enhanced female leadership, preserved cultural heritage, community cohesion and equitable participation. (3) Environmental Sustainability: Resource stewardship, digital environmental communication and eco-friendly visitor management.

Journal of Tourism, Hospitality and Environment Management
JTHEM
EISSN: 0128-178X
Volume 11 Issue 45 (September 2026) PP. 860-876

The Proposed Smart CBT Conceptual Framework

Synthesising these components, this research proposes the Smart CBT Conceptual Framework as illustrated in Figure 2.

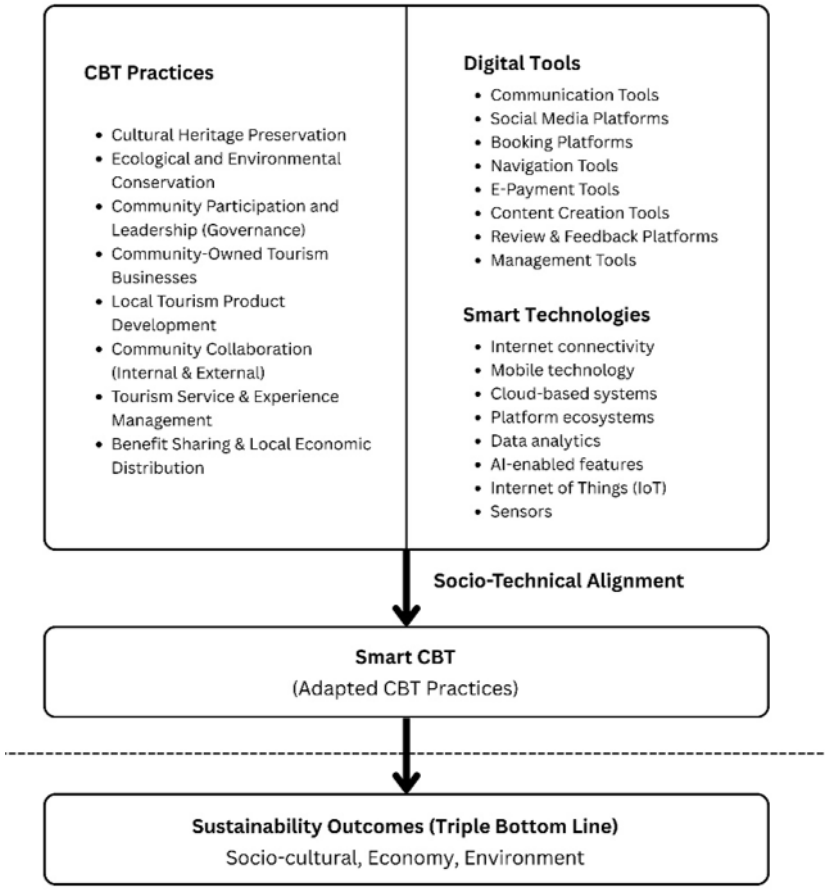


Figure 2: Proposed Smart CBT Conceptual Framework

The framework follows a simple analytical sequence:

Inputs (Top Box): CBT Practices represent the social subsystem, while Digital Tools and Technologies represent the technical subsystem. Together, they form the operational inputs of the framework.

Mediating Mechanism (Middle Arrow): Socio-Technical Alignment explains the fit between technological capabilities and the local socio-cultural conditions in which they are used.
Core Construct (Middle Box): The interaction produces Smart CBT, understood here as CBT practices adapted through appropriate digital use.

Evaluative Outcomes (Bottom Box): The dashed analytical arrow connects Smart CBT Practices to Sustainability Outcomes, considered through the Triple Bottom Line dimensions of economic, socio-cultural and environmental sustainability.

An important distinction in the framework is that CBT practice domains are not treated as sustainability outcomes. They represent what communities do and the settings in which digital

Journal of Tourism, Hospitality and Environment Management
JTHEM
EISSN: 0128-178X
Volume 11 Issue 45 (September 2026) PP. 860-876
tools are introduced and adapted. Sustainability, in contrast, concerns the possible outcomes of these practices. Keeping the two conceptually separate makes it possible to examine why the same digital tool may work differently from one rural community to another. The difference may lie less in the technology itself than in how well it fits existing practices and local conditions.

Discussion

The Smart CBT Framework brings together three concerns that have largely developed along separate lines in tourism research: digital transformation, community-based tourism and the role of women in rural tourism enterprises. Its purpose is not to measure these relationships at this stage, but to provide a conceptual explanation of how digital tools become part of CBT operations. In particular, the framework draws attention to the local conditions, community practices and gender-related realities that influence whether and how a technology becomes useful in practice.

Bridging the Gap Between Smart Tourism and CBT

The framework provides one way of connecting Smart Tourism with CBT at the level of practice. Smart Tourism research has given considerable attention to digital systems, technological readiness and data-based optimisation, particularly in urban or infrastructure-rich settings (Gretzel et al., 2023). CBT starts from a different position, placing greater emphasis on local values, shared responsibilities and culturally informed ways of organising tourism activities (Dangi & Jamal, 2016).

Bringing these perspectives together changes the question from what technology is available to how that technology works within a particular community setting. A digital tool becomes relevant to Smart CBT when it can be incorporated into existing activities, priorities and ways of working. Smart CBT Practices therefore represent digital adoption as part of everyday operations rather than as a separate layer of sophisticated infrastructure. Seen in this way, Smart Tourism becomes more sensitive to its social context, while CBT has a means of accounting for forms of digitalisation that are appropriate to local circumstances.

Digitalisation as Social Inclusion, Not Just Innovation

Digitalisation may also have implications beyond operational efficiency. Digital platforms can widen opportunities for participation, including for women whose involvement may be affected by mobility, time and prevailing cultural norms (Azmi & Ahmad, 2022). Digital marketplaces and mobile payment systems may similarly support access to markets and greater transparency in financial transactions, which relates to the CBT principle of equitable benefit distribution (CBI, 2023). This is consistent with arguments that digitalisation can be understood as a form of social innovation rather than solely as technological change (Fahmi & Arifianto, 2022).

From this perspective, the significance of technology lies partly in the opportunities it creates for people to participate in tourism activities and economic exchanges. Whether those opportunities lead to greater inclusion, however, depends on the conditions under which the technology is introduced and used. Digitalisation within CBT should therefore be considered in relation to existing social arrangements rather than assumed to produce social equity by itself.

Journal of Tourism, Hospitality and Environment Management
JTHEM
EISSN: 0128-178X
Volume 11 Issue 45 (September 2026) PP. 860-876

The Central Role of Women as Catalysts of Smart CBT

Women occupy a central position in this conceptualisation because they are not simply recipients of digital change. As enterprise operators, they participate directly in deciding which technologies are useful, how they are adapted and where they fit within existing community practices. Previous studies have associated women's empowerment with community resilience, innovation and cultural continuity (Efthymiadou & Farmaki, 2023; Ertac & Tanova, 2020). Digital tools may further support this role by creating opportunities for greater market visibility, direct contact with customers and participation in entrepreneurial activities despite structural and socio-cultural barriers (Nambisan, 2017; Verma et al., 2024).

Gender is therefore more than contextual background to the framework. In women-led CBT enterprises, women are part of the social subsystem through which technology is interpreted and put into practice. Their decisions and everyday experiences can shape whether a digital tool is adopted, modified, rejected or incorporated into established tourism activities. This places women's agency within the process of socio-technical alignment rather than treating women only as beneficiaries of digitalisation.

Implications for Sustainable Rural Development

Economic, socio-cultural and environmental sustainability are treated as related outcomes rather than separate concerns. Digital marketing and online booking, for example, may extend market reach and create economic opportunities. The longer-term value of these gains, however, also depends on whether tourism practices maintain community participation and cultural integrity. In the same way, digital communication and monitoring may assist environmental activities, but their contribution depends on how they are incorporated into locally governed practices.

This interrelationship is consistent with sustainability literature that emphasises connections between economic viability, cultural integrity and ecological balance (Dwyer, 2005; Lesar et al., 2019). Within the Smart CBT Framework, digital tools are not assumed to generate sustainability. Their contribution depends on their alignment with community practices and the social conditions surrounding their use. The framework therefore provides a basis for examining whether digitally adapted CBT practices contribute to economic, socio-cultural and environmental outcomes, and under what circumstances.

Conclusion

The conceptual integration presented in this paper offers a coherent theoretical lens for understanding how digitalisation, community values and women's entrepreneurship converge within rural tourism settings. Using a Socio-Technical Systems perspective, the framework considers accessible digital tools alongside established CBT practice domains and asks how the two come together under local conditions. Technology is therefore treated as part of community practice rather than as an intervention operating independently of it.

Women are central to this process because, as operators of CBT enterprises, they make practical decisions about the selection, adaptation and everyday use of digital tools. Smart CBT Practices emerge through this interaction between technological possibilities and the social and

operational realities of the community. Their implications can then be considered in relation to economic, socio-cultural and environmental sustainability.

The framework contributes a practice-oriented interpretation of Smart Tourism that is sensitive to context, while allowing CBT research to account more explicitly for digital transition. As a conceptual framework, it now requires empirical examination. Future research could investigate how Smart CBT Practices differ between rural communities, how women entrepreneurs assess and adapt available technologies, and how these practices relate to sustainability over time. Such work would also provide an opportunity to examine the relevance of the framework beyond Malaysia and across other rural contexts in ASEAN.

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