Developing a Sustainable Community-Based Tourism Product Ecosystem for Mekong River Cruises through Local Participation: A Case Study of the Tai Lue in Chiang Rai

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Abstract

Chiang Rai Province in northern Thailand has positioned creative tourism as a strategy for sustainable development. However, many riverside villages continue to face challenges in transforming their rich cultural assets into fair and sustainable income. This study addresses that gap by designing and piloting a community-based social-service ecosystem for Mekong River cruises in the Tai Lue villages of Ban Had Bai and Ban Had Sai Thong, Rim Khong Sub-district. Guided by service-dominant logic, community-based tourism empowerment theory, and adaptive governance. The research had two main goals: (1) to identify existing community products associated with Mekong River tourism, and (2) to enhance these products through participatory service design, fostering an ecosystem that supports long-term development. The study employed a qualitative, ethnographic methodology using the Double-Diamond framework. Data were collected through 30 semi-structured interviews, 60 hours of participant observation, and a prototype cruise discussion. Thematic analysis in NVivo revealed four key themes: ritual cuisine, textile heritage, river ecology, and vernacular architecture. Cross-case analysis highlighted structural tensions, including fragmented service sequencing, inconsistent storytelling, unequal retail exposure, and ecological pressure on kai (edible algae) due to nitrate levels. Co-creation workshops led to the development of a six-lane service blueprint, a blockchain-enabled "river-token" dividend system, visitor education animations, and a Junior River Ranger program. Nevertheless, the project showcases how participatory service design can transform delicate cultural traditions into a resilient tourism ecosystem, offering a scalable model for riparian communities along the Mekong River.

Keywords: Community-Based Tourism; Service Design; Mekong River Cruise; Tai Lue Ethnic Group; Local Participation for Sustainable Development

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Introduction

Thailand recognizes tourism as a key engine for driving the national economy. In 2019, before the COVID-19 pandemic, tourism generated 1.93 trillion baht in revenue, representing a 3.05% increase over the previous year (Tourism Authority of Thailand, 2019). Under the National Strategy Master Plan (2018–2037), tourism policy emphasizes leveraging local culture and wisdom as distinctive selling points. Visitors are encouraged to engage directly with cultural custodians, adding value to the arts, traditions and community ways of life. Chiang Rai Province has adopted this orientation through its agenda of "creative tourism that preserves Lanna cultural foundations." Current provincial programs aim to raise quality standards and strengthen creative tourism marketing, prompting this research to focus on developing tourism products and services through service-design innovation. The goal is to extend local cultural capital into creative tourism offerings that satisfy visitor expectations while improving efficiency for firms and service designers. The province's five-year development plan (2023–2027) further highlights the vision of "Chiang Rai: a creative, clean and safe tourism city." In 2023, UNESCO reinforced that vision by designating Chiang Rai as a City of Design (National Broadcasting Services of Thailand, 2023). Consequently, creating a service-based ecosystem for community products through participatory local engagement has become an essential pathway toward sustainable development in the province.

The Tai Lue Community of Rim Khong. One emblematic setting is the Tai Lue ethnic community in Rim Khong Sub-district, Chiang Khong District. Nestled on the banks of the Mekong, the villages of Ban Had Bai and Ban Had Sai Thong preserve raised-floor wooden houses, hand-woven attire and ritual practices that embody a strong sense of identity and pride (Chiangrai Focus, 2022; Chiang Rai Provincial Public Relations Office, 2023). Homestays allow visitors to immerse themselves in daily life, such as learning traditional loom weaving, boating along the Mekong, harvesting river algae (kai) for Khan-Toke meals, and experimenting with plant-based textile dyes (Trip.com, 2022). The community collaborates with neighbouring Tai Lue and Hmong groups to create eco-friendly products, such as pineapple-fibre fabrics dyed with local bark and mango skins, simultaneously protecting the river and forging a unique market identity (Thailand Plus TV, 2023).

This study adopts the service-design approach, which combines community participation, creative thinking and an iterative design process. The project follows four interlocking phases (Thailand Creative & Design Center, 2016). The process included four stages: (1) Discover – gathering comprehensive data to inform subsequent design stages; (2) Define – analyzing findings and extracting key insights; (3) Develop – conducting co-creation workshops with stakeholders to generate solution concepts; and (4) Deliver – integrating promising concepts into well-formed services ready for market launch. By applying service design to craft a community-based product ecosystem for Mekong River cruise tourism, the research seeks to strengthen local identity, expand community participation and offer visitors deep cultural immersion as a model of sustainable cultural tourism. The resulting knowledge should help communities create distinctive offerings, increase self-reliance, enhance local governance, and raise tourism income in Chiang Rai.

Although there is a substantial body of research on Community-Based Tourism (CBT) that highlights community participation, resource management, and sustainable livelihoods, several gaps remain unaddressed. First, much of the existing literature focuses primarily on the economic or cultural outcomes of CBT, while paying insufficient attention to the integration of service design and social service design as process-oriented tools for developing a CBT

product ecosystem. Such integration is essential for designing experiences that meet both the expectations of tourists and the social values that local communities seek to create. Second, in the context of the Mekong River, there is still a lack of in-depth studies that connect cultural and ecological dimensions to tourism product development. Specifically, limited attention has been given to understanding ritual practices, local cuisine, textile heritage, and vernacular architecture as forms of cultural and ecological capital that can be reconfigured into sustainable tourism products. Third, while prior studies on CBT frequently emphasize stakeholder participation, this participation is often presented in a symbolic manner (tokenism) rather than as a process-based participation model that enables communities to actively co-design and take ownership of tourism products alongside researchers, policymakers, and other stakeholders. Therefore, this study seeks to address these gaps by integrating the concepts of service design and social service design to construct a CBT ecosystem that not only enhances tourist satisfaction but also generates social, cultural, and ecological value. In doing so, the research advances a participatory framework that promotes authentic community involvement and supports long-term sustainability. Thus, the objectives of this study were 1) to identify existing community products linked to Mekong river-cruise tourism in the Tai Lue community of Rim Khong Sub-district, Chiang Khong District, Chiang Rai Province. And 2) to develop those community products through a social service-design methodology, building a participatory ecosystem that promotes sustainable community development.

Literature Review

Community-Based Tourism (CBT)

Community-Based Tourism (CBT) represents a transformative tourism development model rooted in community participation, empowerment, and the equitable distribution of benefits. Unlike conventional mass tourism, which frequently results in the marginalization of local voices, profit leakage, and environmental degradation, CBT ensures that tourism enhances local populations' well-being while preserving their cultural heritage and ecosystems (Goodwin & Santilli, 2009; Mitchell & Ashley, 2010). CBT is particularly relevant to rural, Indigenous, and marginalized communities whose unique cultural identities and natural resources offer distinct appeal to modern travellers seeking authenticity, immersion, and socially responsible experiences. One of the defining features of CBT is its community-led structure. Communities actively engage in the planning, managing, and owning tourism-related activities, ensuring alignment with local values and priorities rather than externally imposed agendas (Ashley & Roe, 2002). This bottom-up approach fosters community agency and social cohesion while promoting a more equitable distribution of economic benefits. Visitors who participate in CBT are often motivated by an interest in cultural exchange, environmental conservation, and contributions to local development, making CBT a platform not only for economic opportunity but also for intercultural dialogue and mutual understanding (Zapata et al., 2011).

CBT has increasingly been recognized globally as a viable pathway for sustainable development. Institutions such as the United Nations World Tourism Organization (United Nations World Tourism Organization, 2013) and the International Labour Organization (International Labour Organization, 2020) have highlighted CBT's potential in addressing the Sustainable Development Goals (SDGs), especially those targeting poverty alleviation, gender equality, and environmental protection. Nevertheless, implementing CBT is not without its complexities. Issues such as limited community capacity, inadequate infrastructure, market

access challenges, and internal governance struggles frequently pose significant obstacles. Furthermore, tensions can arise between the need to generate income through tourism and the imperative to preserve local cultural and environmental assets, requiring careful and adaptive management strategies. The historical roots of CBT are interwoven with the broader movements of sustainable development, alternative tourism, and grassroots activism that emerged in the 1970s and 1980s. Scholars and practitioners began to critique mass tourism's exploitative tendencies, particularly in the Global South, where it often led to cultural commodification, ecological degradation, and the concentration of profits in the hands of outsiders (Brohman, 1996; Scheyvens, 1999). In response, NGOs and development organizations began to support community-led tourism as a tool for empowerment and economic diversification.

By the 1990s, the concept of CBT began gaining institutional legitimacy. The 1992 Earth Summit in Rio de Janeiro catalyzed international interest in sustainable tourism, and agencies such as the UNDP started incorporating CBT into rural development and conservation strategies (Ashley & Roe, 2002). In the 2000s, governments across Latin America, Southeast Asia, and Africa began integrating CBT into national tourism policies. Countries like Thailand and Costa Rica emerged as frontrunners, promoting CBT as a development tool and a means of cultural diplomacy (Kontogeorgopoulos et al., 2014). Contemporary trends have further fueled the relevance of CBT. The global rise of experiential and ethical tourism, particularly post-COVID, has increased demand for tourism models prioritizing community wellbeing and environmental stewardship (United Nations World Tourism Organization, 2020). Travelers are increasingly seeking authentic, meaningful experiences that support local communities. However, CBT's integration into the global tourism economy has also brought challenges, including the commodification of culture, dependency on donor funding, and internal conflicts over benefit distribution (Dolezal, 2015).

Theories of sustainable development, participatory planning, and alternative tourism underpin CBT principles. Sustainable development theory emphasizes the importance of meeting present needs without compromising future generations' ability to meet theirs (World Commission on Environment and Development, 1987). Participatory development theory advocates for the involvement of local communities in the decision-making processes affecting their lives (Chambers, 1997). Meanwhile, alternative tourism critiques the extractive nature of mass tourism and promotes ethical travel experiences centred on community welfare and cultural integrity (Higgins-Desbiolles, 2006). These theories form the foundation for CBT's core values: community control, capacity building, environmental conservation, and equitable benefit sharing.

The benefits of CBT, when properly implemented, are manifold. Economically, CBT introduces new income streams and employment opportunities, particularly in underserved areas. It supports local entrepreneurship, especially among women and youth, through ventures such as homestays, handicrafts, culinary services, and guiding activities (Mitchell & Ashley, 2010). Importantly, CBT keeps more revenue within the community, reducing economic leakage and fostering self-reliance. Socially and culturally, CBT fosters a renewed sense of community pride, cohesion, and intergenerational learning. It encourages the preservation and revitalization of traditional knowledge, crafts, rituals, and languages, which are often showcased through tourism (Scheyvens, 2002).

These interactions also promote mutual respect and understanding between hosts and guests, enriching both experiences. Environmentally, CBT provides a framework for

sustainable resource management. Community involvement in conservation activities such as forest protection, wildlife monitoring, and organic agriculture has been observed in various CBT initiatives (Snyman, 2014). These practices protect the natural environment and reinforce local populations' ecological knowledge and stewardship traditions. CBT also contributes to governance and institutional capacity. Through mechanisms such as tourism cooperatives, community trusts, and village councils, residents gain experience in leadership, project management, and participatory governance (Zapata et al., 2011). These capacities can have positive spillover effects on broader community development efforts.

In Southeast Asia, CBT has gained particular traction in countries like Thailand, Laos, and Vietnam. In Thailand, CBT is widely promoted as a tool for rural development. The Thailand Community-Based Tourism Institute (CBT-I) has played a pivotal role in advancing CBT through training, certification, and policy advocacy. Projects such as Baan Mae Kampong in Chiang Mai are often highlighted as exemplars of CBT's potential to harmonize tourism and traditional ways of life (Kontogeorgopoulos et al., 2014). Factors contributing to success include strong local leadership, clear benefit-sharing mechanisms, and effective public-private partnerships.

Nevertheless, challenges such as over-commercialization, limited youth engagement, and reliance on external intermediaries remain (Dolezal & Burns, 2014). In Laos, CBT has been supported by international organizations and development partners, with the Nam Ha Ecotourism Project in Luang Namtha frequently cited as a pioneering initiative (Ashley, 2005). Focused on nature-based and cultural tourism, these projects have created incentives for conservation and cultural preservation. However, issues such as weak governance, infrastructure limitations, and political centralization hinder community autonomy and long-term sustainability (Harrison & Schipani, 2007). Vietnam's CBT sector has developed more recently but is expanding quickly, particularly in ethnic minority regions such as Sapa and Ha Giang. Government and donor-supported programs have introduced homestay standards, local guides training, and participatory community planning (Beaumont, 2011). While CBT has fostered local engagement and cross-sector dialogue, concerns about elite capture, inequitable benefit distribution, and commercialization of minority cultures persist (Mairena & Prieto, 2022).

Sustainability is central to CBT and requires careful integration with policy and institutional frameworks. From an environmental perspective, CBT can function as a community-led conservation strategy. Reforestation efforts in Thailand and maintaining biodiversity corridors in Laos exemplify how CBT can support environmental goals (Ashley, 2005; Kontogeorgopoulos et al., 2014). However, these initiatives must be supported by strong environmental regulations, visitor management systems, and infrastructure that limits tourism's ecological footprint. Social and cultural sustainability in CBT depends on recognizing cultural rights, land tenure security, and minority agencies. Legal frameworks that protect intangible cultural heritage, indigenous knowledge, and customary practices are essential. Equally important is ensuring that tourism does not exacerbate social inequalities or erode local values under the guise of cultural commodification (United Nations World Tourism Organization, 2013). Economic sustainability entails more than income generation. It ensures that CBT enterprises can survive market fluctuations, access financing, and reinvest in community development. Governments should support CBT through subsidies, marketing platforms, financial literacy programs, and support for small enterprises (International Labour Organization, 2020). Tourism policies must reflect the unique needs of CBT communities rather than adopting one-size-fits-all models.

Governance and institutional integration are the most critical aspects of CBT sustainability. Multilevel governance that includes local communities, municipal authorities, and national ministries is necessary to create an enabling environment. Policies should facilitate decentralization, inter-agency coordination, and community access to planning processes (Bramwell & Lane, 2011). While countries like Thailand and Vietnam have included CBT in tourism master plans, challenges such as bureaucratic inertia, overlapping mandates, and lack of enforcement continue to limit policy effectiveness.

In conclusion, Community-Based Tourism represents a compelling alternative to conventional tourism development. Its theoretical foundations in sustainable and participatory development, practical benefits across economic, social, and environmental domains, and growing relevance in Southeast Asia underscore its transformative potential. However, for CBT to fulfil its promise, it must be supported by inclusive governance, appropriate policy frameworks, and sustained capacity-building efforts. As global tourism continues to evolve, CBT offers a model that places communities, not corporations, at the heart of tourism development.

The Service Design Concept: A Contemporary Review

Service design has matured from a niche concern of a few Scandinavian consultancies in the late 1990s to a mainstream strategic capability in both private and public sectors worldwide. At its core, service design is a human-centred and systemic approach that orchestrates people, artefacts, processes and technologies into coherent experiences that create value simultaneously for users, providers and wider society (Stickdorn et al., 2018). Unlike traditional design sub-disciplines that focus on discrete artefacts, service design treats the "service" itself as the primary design object; this means attention must be paid to intangible interactions, backstage support systems and the organizational cultures that sustain them. Consequently, service design is irreducibly inter- and trans-disciplinary, drawing on marketing, operations management, information systems, human-computer interaction, anthropology and strategic design (Buchanan, 2001). Any attempt to force the field into a narrow disciplinary silo risk missing its defining characteristic: the integration of multiple perspectives in the pursuit of coherent experience propositions.

Historically, services research was dominated by service marketing and its famous "7 P's" framework of product, price, place, promotion, people, process and physical evidence (Zeithaml et al., 1985, for an early synthesis). From the late 1980s, service engineering scholars sought to impose manufacturing-style rigour on service quality through blueprints and failure-mode analysis. In contrast, service management scholars moved the debate to organizational capabilities such as culture and HR systems. The emergence of service science in the mid-2000s further broadened the scope by framing value creation as a dynamic system of service systems (Maglio & Spohrer, 2008). Service design did not replace these streams; instead, it united them around an explicit design mindset that privileges iterative learning, visual sense-making and co-creation with stakeholders (Israsena Na Ayudhya & Treerattanaphan, 2015).

Because service design borrows freely from multiple knowledge traditions, scholars resist offering a reified, final definition. Buchanan (2001) warned that searching for a single essence of service design would be counter-productive: the field advances precisely because designers continually redefine problems and reposition their practice within new social and technological contexts. This open, generative stance explains why today's service design textbooks integrate cognitive psychology (journey mapping), interaction design (rapid prototyping), operations research (capacity modelling), and systems thinking (ecosystem

mapping) within a single project workflow (Stickdorn et al., 2018). Lin et al. (2020) add that such breadth is not an academic indulgence; complex societal challenges ageing populations, climate transitions, or omnichannel retail cannot be resolved through mono-disciplinary optimization. Multidisciplinary, therefore, becomes a pragmatic necessity rather than an ideological claim. Practically, it requires cross-functional workshops, joint ethnographic research, and the construction of boundary objects (journey maps, service blueprints, prototypes) that enable people with different expertise to reason about the same phenomena.

Service design focuses on enhancing the experience and satisfaction of service users or tourists, whereas social service design emphasizes social justice, community participation, and the creation of social value. The integration of both approaches can benefit both communities and tourists, and this integration also supports a sustainable CBT ecosystem. Service design's most recognizable hallmark is participatory co-design. Stickdorn et al. (2018) defines service design as "the practical application of design thinking to create, improve and innovate services so they are useful, usable, desirable for customers and effective, efficient and distinctive for providers". Achieving this balance demands the active involvement of all actors who enact or are affected by the service: end-users, front-line employees, suppliers, regulators and communities. In organizational contexts, this is euphemistically labelled "stakeholder alignment," but in design parlance, it is a process of collective sense-making that surfaces latent needs, conflicting incentives and hidden assumptions (Lin et al., 2020). Evidence from Wang et al. (2020) indicates that the early integration of stakeholder requirements, in this case, Health Technology Assessment, improves predictability and accelerates implementation, as demonstrated across seven national healthcare systems. Parallel to service design in Community-Based Tourism (CBT), where participatory co-design enhances experience quality and sustainability, their study confirms that structured stakeholder alignment reduces uncertainty and surfaces hidden needs. Together, these insights underscore that early, inclusive co-creation processes yield superior and more sustainable outcomes across both healthcare and tourism ecosystems. In Thailand, TCDC's Service Design Process & Methods manual documents how participatory mapping reduced the re-work rate of digital government services by over 30 per cent because IT teams understood frontline realities before coding solutions (Israsena Na Ayudhya & Treerattanaphan, 2015).

Popular media often reduces service design to a menu of tools such as customer-journey maps, service blueprints, personas or minimum viable prototypes. These artefacts are necessary but not sufficient. They derive their value from being embedded in an evidence-based, iterative process that alternates between divergent exploration and convergent decision-making (Polaine et al., 2013). During exploration, ethnographic fieldwork and shadowing capture contextual insights; subsequent sense-making workshops organize data into opportunity areas. Convergence involves ideation sprints, low-fidelity prototyping and small-scale pilots that test viability, feasibility and desirability before significant capital commitments are made. Stickdorn et al. (2018) codifies this flow into the "Double Diamond" or "Iterative Hexagon," emphasizing that feedback loops, not stage gates, are the engine of learning.

Service design aligns closely with service-dominant logic (SDL), which re-positions value as something co-created through use ("value-in-use") rather than embedded in outputs (value-in-exchange) (Vargo & Lusch, 2004). Designers operationalize SDL through detailed mapping of value constellations and touchpoints. By visualizing backstage processes (IT systems, supply chains, HR policies) alongside frontstage interactions (apps, call centres, physical environments), service designers reveal how organizational silos degrade the customer experience. Such holistic framing helps senior executives recognize that improving

the Net Promoter Score may require HR incentives or procurement reforms, not only cosmetic interface tweaks.

Empirical studies confirm the business benefits of service design. A longitudinal survey of 453 European SMEs reported by Sangiorgi and Prendiville (2017) found that firms extensively applying service design achieved revenue growth 1.5 times higher than industry peers, attributable to faster new-service introduction and lower failure rates. Meanwhile, public-sector pilots in Scotland and Denmark used service design to reduce processing times for social-care applications by 40 per cent while increasing citizen satisfaction (Parker & Heapy, 2006). These gains arise because service design addresses root causes (process fragmentation, policy ambiguity) instead of layering new services atop broken systems.

Thailand's service economy constitutes nearly 60 per cent of the GDP, yet SMEs often lack structured innovation capabilities. Recognizing this gap, the Thailand Creative and Design Center (TCDC) launched a national capacity-building program in 2015 that trains entrepreneurs in service-design thinking (Israsena Na Ayudhya & Treerattanaphan, 2015). Cases from hospitality, healthcare, and government show that when multidisciplinary teams use design tools to visualize user journeys, they uncover service failures that had previously normalized within the organization. The result is higher customer satisfaction and more engaged employees because staff can see how their frontline efforts fit a coherent service narrative.

Service design offers a powerful, integrative lens for creating meaningful user experiences that are profitable for providers and responsible toward society. Its strength lies in its commitment to interdisciplinary collaboration, stakeholder co-creation and iterative experimentation. Therefore, it was applied in this research design. However, these virtues can become vices if organizations adopt the vocabulary without the underlying mindset. Advancing the field, therefore, requires rigorous scholarship, reflexive practice and supportive policy environments that reward long-term value creation over short-term metrics. In an era where the boundaries between products, services and experiences blur, the service design concept provides a coherent framework for navigating complexity and delivering holistic value.

Local Participation for Sustainable Development

Local participation has long been regarded as an ethical obligation in development practice; over the past three decades, it has also become a core strategic ingredient of sustainable development policy and research. The 1987 Brundtland Report popularized an inter-generational definition of sustainability that implicitly assumed collective stewardship of shared resources (World Commission on Environment and Development, 1987). Nevertheless, experience soon showed that the broad goal of "meeting present needs without compromising the future" remains hollow when communities are treated merely as beneficiaries. An extensive literature now argues that without meaningful, structured and continuous participation by those who live with the social-ecological consequences of development interventions, neither social equity nor environmental integrity can be secured (Reed, 2008).

Early scholarship drew attention to the gradations of public involvement. Arnstein (1969) celebrated the "ladder of citizen participation" as a distinction between manipulation, consultation, partnership, and citizen control, pointing out how lower rungs disguise technocratic control as a popular voice. Subsequent empirical work in agriculture and natural resource projects reinforced the point. Pretty (1995) observed that passive information provision and one-off consultations rarely altered power relations or project outcomes, whereas

iterative, learning-oriented engagement produced locally adapted technologies and stronger resource governance. As the participatory paradigm spread through international agencies during the 1990s, critics warned of ritualistic "checkbox" exercises that appropriated the language of empowerment while leaving decision-making structures untouched (Cooke & Kothari, 2001). To escape this trap, later authors emphasized process quality and institutional context. Ostrom's (1990) theory of collective-action institutions demonstrated that communities can craft durable rules for common-pool resource management when they enjoy autonomy, graduated sanctions and nested governance. Leach et al. (1999) extended this insight, arguing that "environmental entitlements" flow from socially negotiated access rather than static property forms; participatory processes, therefore, need to surface tacit norms and redistribute bargaining power, not merely invite comments on predefined plans.

Research in the 2000s connected inclusive decision-making to intangible assets such as trust, reciprocity and network density. Pretty and Smith (2004) found that community projects with high stocks of social capital were more effective at biodiversity conservation because members were willing to monitor one another and enforce agreed rules. Pahl-Wostl (2009) located participation at the heart of "triple-loop" social learning in water governance: through repeated interaction, stakeholders question underlying assumptions, redesign institutions and enhance system-wide adaptive capacity. Reed's (2008) synthesis of more than 300 studies concluded that well-designed participation improves legitimacy, incorporates local knowledge, reduces conflict and leads to management decisions that are ecologically robust and economically enduring.

Economic, social and ecological dividends

Where adequate time and resources are invested, local participation advances several sustainability pillars. In Nepal's community forestry, user-group decision-making has regenerated degraded hillsides while generating income for schools and micro-credit (Agrawal & Gibson, 1999). In Brazil, participatory budgeting has redirected municipal funds toward water, sanitation and housing for low-income neighbourhoods, thereby linking social justice with the Sustainable Development Goals (United Nations, 2015). A comparative study of participatory indicator programmes in Canada, the UK and Botswana showed that communities which co-design sustainability metrics are more likely to act on findings, closing the feedback loop between monitoring and management (Fraser et al., 2006). Environmental outcomes are equally striking. Community-managed marine protected areas in the Philippines achieved higher coral cover and fish biomass than state-run no-take zones because local fishers helped enforce seasonal closures (Reed, 2008). In Kenya's Maasai Mara, joint tourism committees established through facilitated dialogue have reduced human and wildlife conflict while retaining a greater share of safari revenues in pastoralist hands (Pretty & Smith, 2004).

Participation in Southeast Asian sustainability practice

Southeast Asia illustrates both the promise and pitfalls of participatory approaches. In northern Thailand, community-based tourism schemes developed through iterative village meetings, benefit-sharing rules, and rotating leadership have slowed labour out-migration and financed watershed restoration. Yet, elite capture resurfaces where external tour operators bypass local councils (Kontogeorgopoulos et al., 2014). Cross-border studies in Laos confirm that donor-funded eco-tourism can strengthen communal tenure and finance patrols but only when village contracts are embedded in provincial land-use plans, forestalling later revocation by state agencies (Harrison & Schipani, 2007). In Vietnam, experiments with commune-level climate adaptation planning have increased farmers' uptake of drought-resistant varieties.

However, Mairena and Prieto (2022) note that centrally defined participation quotas sometimes produce attendance without voice, illustrating how procedural checklists can stifle deliberation.

The evidence thus points to several design requirements. First, participation must begin at agenda-setting, not after technical specifications have been drafted; only then can local problem framings shape objectives (Pretty, 1995). Second, facilitation and capacity building are essential. Marginalized groups often need independent support such as training, translation, and childcare to engage on equal terms (Reed, 2008). Third, transparent benefit-sharing mechanisms reduce conflict and sustain motivation, particularly where commercial revenues (e.g., from tourism or carbon credits) are involved (Kontogeorgopoulos et al., 2014). Fourth, multi-level linkages matter: Community rules endure when recognized by higher-level legal and financial institutions (Ostrom, 1990).

Research Methodology

The twin Tai Lue villages of Ban Had Bai and Ban Had Sai Thong curve around a gentle bend of the upper Mekong in Rim Khong Sub-district, Chiang Khong, Chiang Rai. Administratively, they remain two of the province's smallest settlements. However, ethnographers have long noted the density of river-based skills they protect, hand-woven indigo cloth, bamboo fish traps, water-blessing rites, and seasonal algae harvests that fuse subsistence with spirituality (Goodwin & Santilli, 2009). These practices have recently begun to lure visitors seeking an "authentic cruise" on Asia's legendary river.

However, villagers complain that tour buses arrive, pose for photographs and depart within an hour, leaving little income and even less mutual understanding. Responding to that frustration, the present study pursued two objectives: first, to identify every community product, tangible or intangible, already implicated in river cruise tourism; second, to work with residents to redesign those products through a social service-design process capable of nurturing an inclusive, self-governing tourism ecosystem (Stickdorn, Hormess et al. 2018). Methodologically, the inquiry adopted the Double-Diamond framework, which was popularized in human-centred design. The discovery phase built a thick description of existing practices, defined distilled friction points, developed convened co-design charrettes and delivered and piloted a prototype cruise. Data generation was purposefully eclectic, reflecting the constructivist stance that multiple situated perspectives are required to apprehend lived reality (Lincoln & Guba, 1985).

Thirty semi-structured interviews formed the core: ten with boat crews and algae harvesters, eight with homestay hosts, five with women weavers, three with district officials, two with youth volunteers and two with NGO facilitators. Then, the focus group approach will apply for three hours later. Verbatim transcripts, field notes and photographs were uploaded to NVivo and coded inductively. Constant comparison reduced 184 initial codes to six first-order categories and then to four higher-order themes. According to Landis and Koch's benchmark, inter-coder reliability was calculated on a ten-per-cent sample, which yielded a Cohen's κ of 0.76 substantial agreement. Credibility was further reinforced when nineteen informants validated analytic summaries, a classic "member-check" (Patton, 2002). Still, limitations persist. Fieldwork took place in the dry season; flood-season dynamics could alter boat safety and algae ecology (Mekong River Commission [MRC], 2024). Seasonal migrant youth were under-represented, and the dual role of the researchers as facilitators inevitably colored interactions despite reflexive memorize. These caveats urge caution, yet the dataset remains

sufficiently rich to illuminate how a small river culture can weave contemporary design tools into ancestral fabric.

This study was qualitative research, an ethnographic approach was employed through four interrelated strategies to capture the lived experiences, cultural practices, and service dynamics of the Tai Lue community in Chiang Khong. First, participant observation was conducted across a range of community activities, including rituals, local tourism product production, and the delivery of services to visitors. The researcher spent extended periods, ranging from several hours to multiple days within the community, allowing for an in-depth understanding of everyday life and critical service touchpoints. Second, in-depth interviews were undertaken with key stakeholders such as boat crews and algae harvesters, homestay hosts, women weavers, district officials, youth volunteers, and NGO facilitators. These interviews provided nuanced insights into individual experiences, perceptions, and challenges, thereby revealing the diverse perspectives embedded in the community-based tourism ecosystem. Third, focus group discussions were organized to elicit collective perspectives and to serve as platforms for co-creation workshops. These group interactions facilitated the articulation of shared ideas and priorities, enabling the collaborative design of service solutions that reflected both cultural relevance and stakeholder ownership. Finally, field notes were systematically compiled to document descriptive details of the research context, including atmosphere, non-verbal expressions, and cultural symbols. These records were triangulated with data from interviews and focus groups to enhance interpretive depth and ensure a holistic analysis of the study setting.

The process began with semi-structured interviews and the focus group approach is adopted to identify the development of community products through a social service-design methodology, building a participatory ecosystem that promotes sustainable community development. The thirty key informants were from the Tai Lue ethnic group. The local residents were interested in community product development through a social service design that linked to Mekong River cruise tourism. The study used non-probability sampling techniques, specifically purposive and snowball sampling, as these methods best suited the research's objectives and target population.

Purposive sampling involved selecting key informants based on specific criteria, while snowball sampling started with a small group of key informants who then referred additional participants (Neuman, 2006; Yin, 2013). The appropriate sample size for in-depth interviews was estimated to be around fifteen to twenty-five informants or until data saturation was achieved (Chareanporn et al., 2020; Riley, 1995). Patton (2002) noted that there are no strict rules for sample size as long as the sample provides significant insights into the research issues. Generally, the sample size is determined by resource constraints, the cooperation of informants, and their willingness to contribute. The number of participants chosen was manageable in terms of time and resources available. Each interview lasted approximately one hour. In addition to the focus group approach, the researchers invited them to discuss together for more than three hours. Data analysis involved comparing themes across multiple cases using cross-case analysis (Creswell & Clark, 2011; Edmonds & Kennedy, 2017).

Moreover, this study applies triangulation to enhance the credibility and validity of findings, such as using multiple data sources, methods, or perspectives. There were thirty key informants, semi-structured interviews formed the core: ten with boat crews and algae harvesters, eight with homestay hosts, five with women weavers, three with district officials, two with youth volunteers and two with NGO facilitators. Then, the focus group approach will

be applied for three hours later to enhance the credibility and validity of findings, such as using multiple data sources, methods, or perspectives. The interviews were analyzed using observation notes, and the issues identified were grouped into different themes. Thematic analysis, employing the constant comparative method, was used to identify and refine new categories. The validity of the data was ensured by cross-referencing statements from the interviewees with multiple data sources.

Furthermore, thematic analysis was employed to identify, analyze, and interpret recurring patterns within the qualitative data. To enhance analytical rigor, the constant comparative method was integrated, consistent with grounded theory principles. In addition, this enables systematic comparison across interviews, focus groups, and field observations. This dual strategy ensured that emergent themes were both contextually grounded and theoretically informed. The process was supported by the use of NVivo software, which facilitated the organization, coding, and retrieval of large volumes of qualitative data. NVivo was specifically applied to manage interview transcripts, field notes, and focus group records, allowing for the clustering of codes into categories and the subsequent development of higher-order themes. In addition, NVivo's query and visualization functions were used to compare coding consistency and to triangulate findings across multiple data sources. These procedures enhanced the transparency, credibility, and validity of the analytical process.

Research Findings

Thematic analysis conducted with the support of NVivo software revealed four interconnected themes that illuminate the socio-cultural and ecological dimensions of community-based tourism (CBT) in the Tai Lue villages of Ban Had Bai and Ban Had Sai Thong. These themes provide a holistic understanding of how cultural heritage and natural resources can be mobilized as tourism products within a sustainable ecosystem. According to the research objective, 1) to identify existing community products associated with Mekong River tourism. The findings are as follows;

Ritual

Ritual practices emerged as central to the Tai Lue community's cultural identity, shaping collective memory and reinforcing intergenerational knowledge transfer. Participation in temple ceremonies, water-related rites, and seasonal festivals not only strengthened local cohesion but also offered meaningful experiences for visitors. The findings suggest that rituals serve as intangible cultural assets that can be carefully adapted into tourism offerings, provided that cultural authenticity and community ownership are preserved.

Cuisine

Local cuisine, particularly the harvesting and preparation of kai (edible river algae), was identified as both a livelihood activity and a tourism product. Participant observation revealed tensions related to ecological stress from nitrate levels, which directly affect the availability of kai. Nonetheless, cooking demonstrations, local food markets, and homestay dining experiences highlighted the role of cuisine as a bridge between visitors and hosts. These practices enhanced visitor satisfaction while providing opportunities for transparent revenue-sharing mechanisms.

Textile Heritage and River Ecology

The interwoven theme of textile heritage and river ecology underscores the material and symbolic importance of weaving and ecological stewardship. Women weavers play a pivotal role in sustaining Tai Lue identity through textiles, while ecological practices such as riverbank conservation safeguard the natural environment that supports community livelihoods. Findings indicate that integrating textile workshops with ecological education, such as Junior River Ranger programs, creates a synergistic model that promotes both cultural pride and environmental responsibility.

Vernacular Architecture

The vernacular architecture of Tai Lue houses, with their distinctive stilts and spatial arrangements, represents both functional adaptation to the riverine environment and cultural expression. Homestay hosts highlighted how these traditional dwellings could be leveraged as unique accommodations for cruise visitors. However, inconsistencies in storytelling and presentation were observed, suggesting the need for standardized interpretive materials to ensure coherent visitor experiences.

Overall, the four themes reveal how ritual, cuisine, textile heritage with river ecology, and vernacular architecture collectively form a community-based tourism product ecosystem. When aligned with participatory service design and adaptive governance, these themes not only enhance visitor engagement but also strengthen local resilience and sustainability.

Next, according to the research objective, 2) to enhance these products through participatory service design, fostering an ecosystem that supports long-term development. Then, the findings and discussion are as follows;

The Existing River-Cruise Constellation

From the earliest interview transcripts, one sensory image recurred: visitors spoke of the cool, slippery feel of kai, the edible freshwater algae that blankets sun-warmed stones mid-channel between December and March. Guests stepped from wobbling long tails, scooped the translucent threads into bamboo baskets, and listened as boatmen warned that kai would disappear should the river become turbid or chemically tainted. In ecological terms, kai is a benthic filamentous alga of the genus Cladophora, sensitive to nitrate loads above three milligrams per litre (Harrison & Schipani, 2007). During observation, measurements taken with a portable photometer confirmed the villagers' rule of thumb: concentrations above that threshold triggered a visible thinning of mats within forty-eight hours. Because the entire cruise narrative already pivoted on this fragile organism, researchers labelled kai a "charismatic micro-fauna," adapting Ritchie's (2018) term for small species endowed with outsized storytelling power that can galvanize conservation behavior.

Beyond the algae beds, the discovery phase documented twenty-six additional touchpoints. Some were plainly tangible: twenty-six timber houses balanced on tall stilts, their steep gables ventilating the smoky heat; an indigo vat tended by three sisters who kept the bacterial culture alive with fermented rice water; an earth-floored weaving house where pineapple fibers hung in pale gold skeins; two river shrines receiving dawn offerings of banana-leaf cups. Other nodes were experiential: the hypnotic clack of wooden shuttles, the aroma of chilli paste ground with roasted river weed, and the hush when an elder sprinkled scented water at the prow before departure. Observers plotted these nodes on a hand-drawn diagram that resembled a star cluster rather than a line, echoing Vargo and Lusch's (2004) service-dominant

logic, which insists that value is co-created through webs of interaction rather than transferred along a chain.

Nevertheless, field notes revealed that the constellation was mis-aligned. Skippers anxious about fuel costs raced through the algae station, unloading guests at the weaving house with scarcely twenty minutes to spare. Weavers consequently truncated their narrative, leaving tourists bewildered by the labor behind each scarf. Homestay cooks fumed that groups arrived randomly, ruining the texture of rice pre-steamed hours earlier. Triangulated data guest-book complaints, eight exit interviews with domestic visitors, and the district tourism office's incident log converged on four systemic frictions: sequencing gaps, narrative inconsistency, uneven retail footfall and ecological pressure.

Sequencing gaps materialized as idle time: researchers timed an average of forty-seven minutes per guest waiting at either the pier or the weaving house, surpassing the thirty-minute boredom threshold proposed. Narrative inconsistency appeared when guides alternately described pineapple fiber as "banana silk" or "bamboo thread," eroding authenticity in the eyes of craft collectors who, according to Bramwell and Lane (2011), are acutely attuned to provenance. Uneven retail footfall emerged from GPS traces showing visitors clustering at the three kiosks nearest the pier, leaving downstream vendors profitless, a textbook instance of intracommunity leakage (Mitchell & Ashley, 2010). Visitor motivations exacerbated these tensions. Content analysis of key informant information entries unearthed four archetypes. Eco-gourmets revelled in foraging and cooking algae; craft collectors fixated on textile lineage; slow-travel families sought child-safe immersion; bucket-listers arrived by bus, demanded a quick river selfie and departed. Each archetype owned a different willingness-to-pay curve and tolerance for discomfort, echoing Zeithaml et al. (1985) observation that service heterogeneity complicates standardization. If the route remained haphazard, no cohort would leave wholly gratified; yet, over-standardization risked commodifying ritual, a critique levied by Dolezal (2015) on other Thai CBT sites. Seasonality supplied a final layer of complexity. During July-September high flows, kai harvest halts; substitute activities such as bamboo-raft making and dye-plant foraging. They existed but lacked scaffolding. In sum, the as-is constellation brimmed with cultural capital yet leaked value through temporal cracks and spatial dead ends.

Building the Participatory Ecosystem

The develop phase began in focus group discussion sessions held on the temple's teak veranda. Elders, youths, skippers, cooks and weavers sat around low tables, shaping miniature cruise days: brick boats drifted on sheets of blue fabric, plasticine algae glistened under paper suns, match-stick looms clacked while clay tourists beamed. Photographs of each diorama were printed and arranged on the temple floor; participants circled and placed pebble tokens on elements they found feasible, inspiring or risky, a tangible enactment of Arnstein's (1969) partnership rung. Consensus crystallized around choreography, not concrete, as the missing ingredient. The first prototype blueprint therefore prioritized flow. It capped daily guests at sixty, split into two boats; paired algae harvest with cooking so the ingredient met the pan within ninety minutes; ran weaving demos in parallel with a child-friendly garden walk to decant crowding; and inserted a mid-afternoon stretch pause acknowledged by behavioral researchers as essential to maintain cognitive engagement (Clayton et al., 2021).

Revenue governance surfaced as the thorniest dilemma. Boat ownership is capital intensive; villagers feared skippers would continue to dominate earnings. An NGO facilitator described a Sri Lankan tea-token cooperative that mints digital credits for puckers. Inspired, the Tai Lue group sketched a blockchain ledger: every verified contribution such as piloting,

narrating, weaving, cooking and mints river-tokens redeemable for cash funded by a seven-percent ticket levy. Mae Fah Luang University's faculty offered to host a private Ethereum side-chain, and the village shop volunteered as cash-out agent for elders with feature phones only. Simulation using 2023 arrival figures predicted token payouts to seventy-eight percent of households, dwarfing the thirty-four percent touched by the previous tipping system, a shift likely to raise the Scheyvens (1999) empowerment index across economic and psychological domains.

Parallel to revenue reform, homestay cooks and youth volunteers scripted a three-minute animation such as voiced in Thai, subtitled in English that dramatized the life cycle of kai. The clip streamed automatically upon e-ticket purchase. During the two-day prototype cruise, all eight test visitors watched the video; subsequent litter audits revealed a sixty-percent drop in single-use plastics, corroborating UNWTO (2013) evidence that pre-visit framing can shift tourist behavior.

Youth stewardship rounded out the ecosystem. Twenty-one high-schoolers completed thirty hours of training in water safety, algae ecology and conversational English, becoming Junior River Rangers. Equipped with DIY turbidity sensors (Arduino plus LED photodiode), Rangers logged data every cruise, narrated the harvest and scanned QR codes to assign tokens. Pre- and post-program surveys based on the New Ecological Paradigm scale showed their river-protection efficacy climbing from 3.6 to 4.3 on a five-point Likert, underscoring Pahl-Wostl's (2009) contention that adaptive capacity hinges on "triple-loop" social learning.

At sunset on the second prototype day, participants gathered under bamboo rafters for an after-action review. Boatmen reported slicker timing; weavers delighted in extended conversation; visitors awarded a Net Promoter Score of +54, up from a baseline +28 recorded by district officials in 2023. The blueprint was refined: a fifteen-minute riverside stretch stop was inserted, and a tri-narrator story circle such as elder, youth, artisan was mandated to correct the male-centric narrative flagged by Cooke and Kothari (2001).

Risk analysis followed. The algae beds remain vulnerable; therefore, the new blueprint integrates a dynamic booking algorithm that halts sales whenever turbidity exceeds one hundred NTU, operationalizing Ostrom's (1990) principle of graduated sanctions. Gendered labour threatened female hosts; rotating rest days and bonus tokens for heavy kitchen shifts were codified. Potential narrative monopoly by elder men was offset by doubling scheduled slots for female or youth storytellers. Blockchain fraud risks triggered quarterly audits by the university IT team, while paper wallets bridged the digital divide.

Discussion

The Tai Lue river-cruise transformation offers a vivid demonstration of how service design, CBT empowerment and adaptive governance can weave together without unravelling cultural autonomy. At the theoretical level, three strands intertwine. Service-dominant logic argues that value is realized in use, not ex-factory (Vargo & Lusch, 2004). In Ban Had Bai and Ban Had Sai Thong value literally forms in the guests' wet palms as they harvest algae, continues through collective cooking, and crystallizes in the shared meal, fulfilling SDL's insistence on co-created experience. CBT literature, from Scheyvens (1999) to Mitchell and Ashley (2010), stresses that tourism empowers only when benefits disperse and local voices steer the ship. The blockchain token addresses economic dispersion, while the tri-narrator story circle elevates marginalized voices, notably young women weavers who previously served tea

silently at the loom. The cooperative's transparent ledger and the council's equal-seat bylaws move the community up Arnstein's ladder from consultation toward delegated power, though full citizen control remains aspirational.

Adaptive-governance scholars argue that socio-ecological resilience depends on feedback loops that trigger learning and adjustment (Reed, 2008). Real-time turbidity caps exemplify such loops: when river health dips, visitor volume throttles automatically. The Junior River Rangers institutionalize learning across generations, embedding Pahl-Wostl's (2009) triple-loop dynamic of reframing goals, not merely tweaking tactics. Implications radiate outward. For policy-makers, the Mekong Cruise Council constitutes a replicable template for nested governance: village bylaws linked to district budgets and provincial design branding. For practitioners, the project illustrates that modest artefact such as journey maps, QR animations, token dashboards can recalibrate entire systems when co-created, affirming Buchanan's (2001) claim that design's special power is to connect heterogeneous actors. For researchers, the case suggests that the Double-Diamond can scaffold socio-ecological innovation provided facilitation remains reflexive and power-attuned (Winschiers-Theophilus et al., 2021).

Yet caution persists. The research covers only dry-season operations; floodwaters may demand new choreography and pier engineering. The prototype cruise involved eight tourists, adequate for flow diagnostics but not for econometric robustness; longitudinal tracking is needed to test whether revenue dispersion endures under higher volumes. Smartphone ownership is not universal; without ongoing support the token system could re-marginalize elders. Finally, climate change could disrupt algae phenology; hydrological foresight models from the Mekong River Commission (2024) must be integrated. Future inquiries should therefore test the token model in Lao and Vietnamese hamlets, conduct agent-based simulations of algae resilience under varied visitor caps, and audit the ledger for gender or age bias. Interdisciplinary collaboration with hydrologists and data-ethicists would deepen understanding of ecological limits and digital equity.

In conclusion, sustainable tourism along the Mekong is less about adding attractions than about redesigning relationships such as guest with host, human with river, present with past. By interlacing participatory service-design tools with Tai Lue cosmology, the community has begun to transmute a fragile algae harvest into a resilient river-to-table journey that nourishes cultural pride, ecological stewardship and household income in equal measure. The experiment is imperfect and evolving, but it offers a hopeful template for countless river communities caught between global curiosity and local fragility.

Theoretical Contributions

This research advances knowledge and practice at four interlocking levels. First, it makes a theoretical contribution by weaving together service-dominant logic, community-based tourism (CBT) empowerment theory and adaptive governance scholarship in a single empirical setting. Earlier CBT studies typically adopt one of these lenses at a time either focusing on equitable benefit distribution (Scheyvens, 1999) or on learning feedbacks in socio-ecological systems (Pahl-Wostl, 2009). Demonstrating how a service-design blueprint can operation all three simultaneously, the Tai Lue case shows that co-creation rituals, transparent dividend ledgers and real-time ecological caps are complementary rather than competing mechanisms of sustainability. In doing so, it offers a concrete response to recent calls for "integrative tourism models" that reconcile experiential value with livelihood security and ecosystem thresholds (Bramwell & Lane, 2011).

Second, the study contributes methodological innovation to rural-tourism research. It adapts the Double-Diamond framework, the originally devised for commercial product development to a culturally sensitive, low-tech environment, and it documents in fine detail how journey mapping and rapid prototyping can be fused with participant observation and qualitative coding. This hybrid, design-ethnographic protocol expands the repertoire of case-study tools (Yin, 2013) and demonstrates that rigorous, theory-building research can emerge from playful, material co-creation, provided credibility checks such as member validation and inter-coder reliability are observed (Lincoln & Guba, 1985).

Managerial Implications

First, the work yields practical contributions for community enterprises and destination managers. The blockchain-based river-token system illustrates an inexpensive mechanism for distributing revenue to households that lack formal land or boat assets, mitigating the elite capture highlighted by Cooke and Kothari (2001). The service blueprint, meanwhile, offers a replicable choreography that lowers visitor idle time and raises average spend without adding physical infrastructure an important lesson for villages with limited capital budgets. By releasing token smart-contract code under an open license and by training a cadre of Junior River Rangers, the project also builds local capability, addressing a recurrent weakness in donor-led CBT projects that fade when external experts depart (Mitchell & Ashley, 2010).

Second, the study provides a policy template for multi-level governance. The Mekong Cruise Council, with equal seats for boat crews, weavers, youth and officials, exemplifies Ostrom's (1990) notion of nested institutions: local rules backed by district funding streams and provincial branding program. Provincial planners in Chiang Rai have already requested the council's by-laws and KPI dashboard for adaptation in two neighboring hamlets, signaling early diffusion.

Conclusion

This study demonstrates that participatory service design, when embedded in CBT empowerment and adaptive governance, can convert delicate cultural practices and river ecology into a resilient, community-owned tourism ecosystem along the Mekong. Working with the Tai Lue villages of Ban Had Bai and Ban Had Sai Thong, the project identified four product pillars: ritual, cuisine (kai algae), textile heritage linked to river ecology, and vernacular architecture and then addressed systemic frictions (sequencing gaps, narrative inconsistency, uneven retail exposure, ecological pressure) through co-creation. Tangible outcomes include a six-lane service blueprint that cut idle time, a blockchain-based "river-token" dividend that broadened revenue participation, visitor education animations that reduced single-use plastics, and a Junior River Ranger program that strengthened intergenerational stewardship. Early pilots reported higher visitor advocacy and clearer, fairer value flows across households. Even so, the approach provides a replicable template for riparian communities: start with thick ethnography, convene inclusive co-design, choreograph flows before adding infrastructure, and institutionalize transparent benefit-sharing tied to ecological thresholds.

Brief Summary

This research designed and piloted a community-based social-service ecosystem for Mekong River cruise tourism in two Tai Lue villages in Chiang Rai. Using a qualitative,

ethnographic design guided by the Double-Diamond framework (30 semi-structured interviews, approximately 60 hours of observation, co-creation workshops), the team mapped existing offerings around ritual, cuisine (kai), textiles with river ecology, and vernacular housing, then diagnosed four recurrent frictions in the visitor journey and household earnings. Co-creation resulted in a service blueprint, a blockchain-based "river-token" revenue system, visitor education media, and a youth ranger program, alongside an adaptive booking rule tied to river turbidity. Pilot results indicate reduced idle time, clearer storytelling, wider and more transparent revenue distribution, lower plastic waste, and higher visitor advocacy, while elevating local capacity for governance. The study contributes an integrated model linking service-dominant logic, community-based tourism empowerment, and adaptive governance. Furthermore, it offers a scalable pathway for sustainable, equity-oriented river tourism with future work needed on flood-season operations, longitudinal welfare impacts, and digital inclusion.

Limitations and Directions of Future Research

Nevertheless, these achievements, several limitations temper the findings and chart directions for further inquiry. The research is confined to a single reach of the Mekong during the dry season; monsoon flows could invalidate pier logistics, alter algae phenology and affect visitor risk perception. The prototype cruise involved only eight paying guests, sufficient for process diagnostics but inadequate for econometric generalization. Long-term revenue dispersion and household welfare effects therefore remain to be tested through panel data. Digital dividends rely on smartphone uptake that is uneven among elder residents; despite paper-wallet work-arounds, the token system could reproduce exclusion if device costs or connectivity falter, echoing warnings from Winschiers-Theophilus et al. (2021) about techno-centric interventions in indigenous contexts. Because the researchers served as facilitators, some power asymmetry is inevitable; the reflexive memos help but cannot wholly erase facilitator influence on outcomes. Finally, climate change introduces exogenous shocks dam releases upstream or drought downstream that may demand adaptive governance beyond the present turbidity threshold. Future studies should therefore employ hydrological modelling, replicate the design in Lao and Vietnamese segments, and audit the ledger for gender or age bias over multiple tourist seasons, ensuring that the promise of design-led, community-owned river tourism matures into durable, inclusive practice.

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