

## Buddhist Environmentalism and Circular Innovation: A Community Based Model for SDG Localization in Thailand

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### Abstract

This study explored the integration of circular economy (CE) principles with local cultural and spiritual systems through an embedded case study of Wat Chak Daeng Temple and the Bang Nam Phueng Floating Market in Thailand. Situated within the broader Sustainable Development Goals (SDGs) framework, particularly Goals 11, 12, and 13, the research introduced the Culturally Embedded Circular Innovation (CECI) framework to examine how Buddhist environmentalism, grassroots innovation, and cross-sector collaboration enabled community-led sustainability transitions. Using qualitative methods including in-depth interviews, participant observation, document analysis, and international participant reflections, the study identified key themes related to spiritual legitimacy, community co-creation, and behavioral transformation. The findings affirmed that sustainability was most effective when it was culturally resonant, morally grounded, and socially inclusive. Temples emerged as both ethical anchors and innovation platforms, facilitating behavior change through spiritual narratives and community trust. The research contributed to academic discourse by offering a transferable framework for culturally adaptive CE practices and demonstrated potential for international knowledge exchange, particularly in Global South contexts. The study concluded that localized and spiritually grounded approaches offered a promising pathway for translating global sustainability targets into meaningful grassroots action. RetryClaude can make mistakes. Please double-check responses.

**Keywords:** circular economy, Buddhist environmentalism, local innovation, Community Based Model, SDGs.

## Introduction

Considering escalating environmental challenges such as climate change, waste mismanagement, and overconsumption of resources, the circular economy (CE) has emerged as a paradigm for sustainable development. CE aims to eliminate waste, retain materials in productive use, and regenerate natural systems (Ellen MacArthur Foundation, 2021). In Thailand, CE policies are increasingly aligned with the Sustainable Development Goals (SDGs), particularly Goals 11, 12, and 13. Yet, implementation at the community level remains fragmented and often lacks socio-cultural integration (Bocken et al., 2022).

A pressing environmental issue in urban Thailand is the high generation of municipal solid waste, with an average of 1.14 kg per person per day, amounting to over 27 million tonnes annually. Notably, approximately 65% of this waste of which organic waste constitutes around 64% is disposed of in landfills without proper separation or recovery, contributing to greenhouse gas emissions and environmental degradation (Bunditsakulchai & Liu, 2021; Rado, 2022). Plastic waste alone accounts for about 2 million tonnes annually, with recycling rates remaining below one-third (Jambeck et al., 2015; Poompruek et al., 2022). These challenges are not merely technical but are deeply rooted in social behaviors and cultural practices, underscoring the need for context-sensitive circular solutions. In the Thai cultural context, Buddhist environmental ethics rooted in principles such as moderation (Santutthi), non-harm (Ahimsa), and interdependence (Paticcasamuppada)—provides a moral and philosophical foundation that can strengthen the adoption of circular practices. By framing resource conservation and waste reduction as acts of merit-making (Bun), communities can align CE principles with long-standing spiritual values, thereby enhancing both participation and sustainability outcomes (Darlington, 2012).

This study investigates two community-driven models in Phra Pradaeng District, Wat Chak Daeng and the Bang Nam Phueng Floating Market where Buddhist environmental ethics, cultural identity, and grassroots innovations converge to form a locally embedded CE framework. Initiatives such as plastic robe recycling, composting programs, and eco-tourism illustrate how sustainability can be both spiritually motivated and practically operationalized. Using an embedded case study approach, the research draws on qualitative data from interviews, participant observation, community records, and reflections from 70 international participants of the UN-SDGs Bootcamp Forum 2025. The findings highlight how CE practices gain resilience when grounded in local traditions, spiritual leadership, and inclusive collaboration, offering replicable insights for culturally adaptive sustainability worldwide.

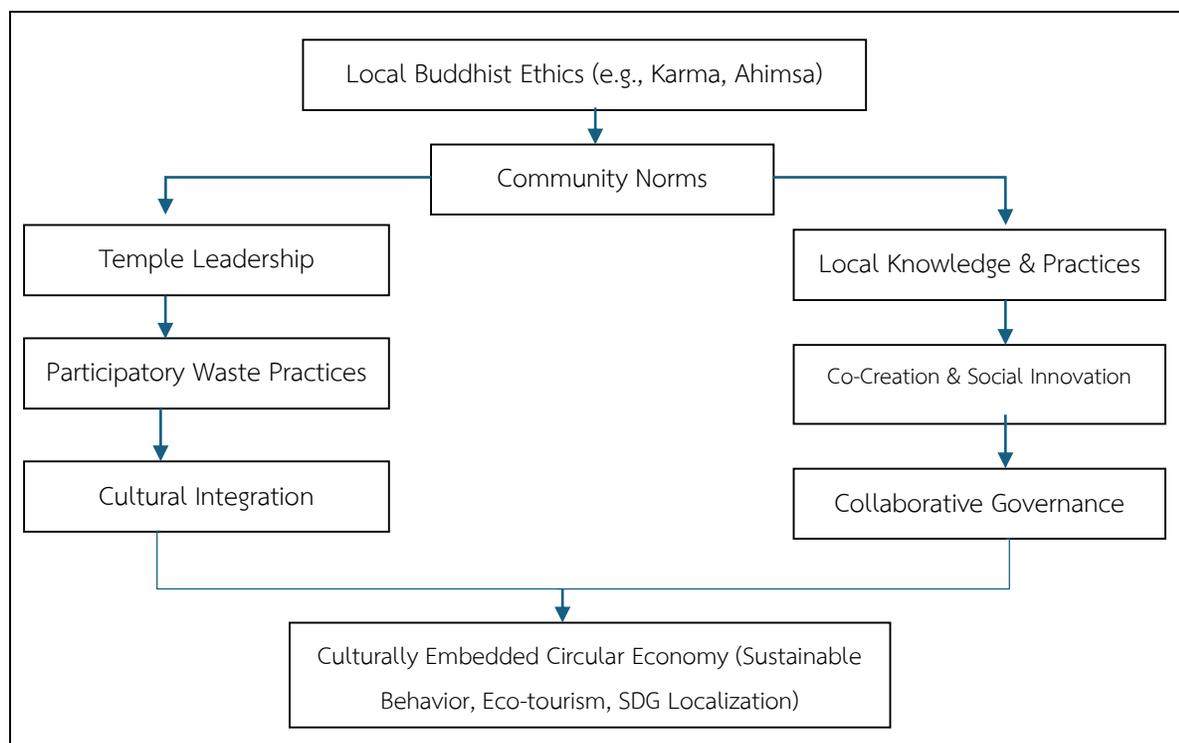
### Research Objectives

1. **To examine** how circular economy (CE) principles can be localized through cultural, spiritual, and participatory practices within a Thai community context.
2. **To investigate** the roles of Buddhist environmental ethics, grassroots innovation, and cross-sector collaboration in shaping community-based circular models that align with Sustainable Development Goals (SDGs) 11, 12, and 13.
3. **To develop** an analytical framework, Culturally Embedded Circular Innovation (CECI) to guide future applications of culturally responsive circular economy practices.

### Conceptual Framework

Based on the preceding literature, this study adopts a synthesized conceptual framework that integrates Circular Economy (CE), Buddhist Environmentalism, and Community-Based Innovation. CE provides the structural lens for analyzing resource flow, waste management, and systemic transformation. Buddhist Environmentalism introduces a moral and spiritual dimension that emphasizes mindfulness, moderation, and collective merit-making through environmental action. Community-Based Innovation contributes a governance and agency perspective, emphasizing co-creation, trust, and long-term ownership.

Together, these three pillars form the foundation of a Culturally Embedded Circular Innovation Model. This model hypothesizes that when circular practices are aligned with cultural and religious values and developed through participatory governance, they are more likely to be adopted, sustained, and scaled. In this study, Wat Chak Daeng and the Bang Nam Phueng Floating Market serve as embedded sub-units where these elements interact. The conceptual framework guides both data collection and thematic analysis, allowing for a holistic understanding of the social, spiritual, and technical dynamics underpinning circular innovation in the Thai context.



**Figure 1:** Culturally Embedded Circular Innovation (CECI) Framework

In the context of this study, the term “culturally embedded” refers to sustainability practices that are not merely adapted to local conditions (context-based), but are anchored in a community’s shared moral values, historical traditions, and social identity. This embedding allows for sustained behavioral change because environmental actions become expressions of cultural belonging and ethical responsibility. Contextualized linguistic variety and avoid redundancy, this manuscript will use alternative expressions such as “culturally grounded,” “locally anchored,” or “contextualized sustainability” where appropriate, while retaining the original term when emphasizing the deep structural integration of culture and practice.

Religious institutions, such as temples, can be conceptualized as “spiritual infrastructures” within social innovation ecosystems (Wongchai & Phromsila, 2022; Williams, 2020). In this capacity, they provide not only moral legitimacy but also the spatial, social, and organizational resources necessary for experimentation and community co-creation. This aligns with the concept of “institutional entrepreneurs” in innovation studies, where trusted cultural actors initiate and sustain change by mobilizing symbolic capital and community trust (Battilana et al., 2009). By

positioning temples within this theoretical framing, their role in the CECI model moves beyond mere moral authority to encompass active facilitation of innovation networks.

### Literature Review and Theoretical Framework

The circular economy (CE) has traditionally been framed as a system-level transition focused on material efficiency and industrial redesign. The Ellen MacArthur Foundation (2021) defines CE as a system that eliminates waste and pollution, keeps products and materials in use, and regenerates natural systems. While such frameworks have shaped global policy and business practices, scholars such as Bocken et al. (2022) argue that CE's long-term viability depends on its contextual adaptability particularly within developing nations where local socio-cultural values mediate environmental behavior. In the Thai context, CE cannot rely solely on formal policy mechanisms. Research by Boonprasert & Rojniruttikul (2021) indicates that localized adoption must align with traditional worldviews and everyday practices to drive lasting change. For peri-urban communities such as Bang Nam Phueng, this suggests that CE models must engage with lived realities and cultural meaning-making, rather than treating waste solely as an economic input.

Buddhist environmentalism presents a complementary lens that infuses CE with spiritual and ethical foundations. Rooted in doctrines such as non-harming (ahimsa), moderation, and interdependence, Buddhist teachings offer moral justification for ecological mindfulness (De Silva, 2020). In Thailand, temples are central community institutions—simultaneously moral, educational, and spiritual hubs. The work of Phra Maha Pranom (2023) exemplifies this intersection, demonstrating how waste management can be framed as karmic purification and collective merit-making. Such framing repositions sustainability not merely as a technical mandate, but as a form of spiritual practice.

In addition to the concept of “Buddhist environmentalism,” which is deeply rooted in Buddhist doctrines such as karma, ahimsa (non-harming), and merit-making for the benefit of society and the environment, there exists a broader, cross-cultural perspective known as “spiritual ecology.” Spiritual ecology investigates the relationship between spiritual worldviews and ecological systems across diverse religions and cultural traditions (Berkes, 2017; Taylor & Van Wieren, 2019). The key distinction lies in the source and scope of moral authority: Buddhist environmentalism draws directly from specific Buddhist teachings, offering explicit ethical precepts and ritual practices that frame environmental action as part of spiritual cultivation, whereas spiritual ecology often integrates multiple belief systems and forms of spiritual meaning

without being confined to a single religious canon. Clarifying this distinction underscores that the CECI framework proposed in this study is grounded primarily in Buddhist environmentalism, rather than a generalized amalgam of spiritual-environmental perspectives.

Comparable models of faith-based environmental action can be found in other religious and cultural contexts. In India, Gandhian environmentalism integrates non-violence (*ahimsa*) with village-based resource stewardship, emphasizing moral self-reliance and ecological harmony (Hardiman, 2021). In Islamic contexts, the principle of *khalifa* (stewardship) and *amana* (trust) underpins water conservation and sustainable agriculture in rural communities (Safi & Abdelzaher, 2019). Similarly, Christian eco-theology frames ecological responsibility as a form of creation care, mobilizing congregations for habitat restoration and sustainable farming (Deane-Drummond, 2017). These cases illustrate that while the moral foundations differ, faith-based institutions across traditions can serve as effective catalysts for sustainability when their spiritual values are aligned with environmental action.

Community-based innovation and co-creation offer operational pathways for embedding CE in local settings. Mont et al. (2021) define co-creation as a collaborative process where citizens, local institutions, and civil society jointly generate solutions. Unlike top-down interventions, these grassroots approaches tend to be more resilient, equitable, and reflective of community knowledge. In the case of Bang Nam Phueng, such dynamics are evident in the co-development of waste banks, EM ball production, and participatory eco-tourism. These initiatives reflect a fusion of local agencies, cultural tradition, and sustainability innovation.

Overall, this review positions CE not as a universal model, but as a culturally and spiritually embedded framework. The intersection of Buddhist environmentalism, community-driven innovation, and localized CE strategies forms the conceptual foundation for the current study and informs the development of the Culturally Embedded Circular Innovation (CECI) framework introduced herein.

## Research Methodology

This study employed a qualitative embedded case study design to explore how spiritual beliefs, community norms, and participatory innovation jointly contribute to circular economy transitions. The methodological approach was closely aligned with the CECI framework, ensuring that each step of the research process reflected its conceptual dimensions namely, Buddhist ethics, cultural integration, and collaborative governance.

Data collection was conducted through four integrated strategies. First, in-depth interviews were held with purposefully selected participants, including monks, local leaders, teachers, market vendors, and municipal officers. These individuals were chosen because they embodied or influenced various components of the CECI framework. The interviews were designed to elicit participants' lived experiences and interpretations of how moral values such as karma and ahimsa informed their environmental actions, thereby directly linking spiritual foundations to sustainable practices.

Second, the researcher engaged in immersive participant observation at key community sites Wat Chak Daeng and the Bang Nam Phueng Floating Market. Observations focused on rituals, daily behaviors, and educational activities related to waste management, including EM ball production, recycling ceremonies, and local eco-tourism events. These observations provided first-hand insight into how participatory practices emerged from temple leadership and community interaction, reinforcing the dimension of cultural integration.

Third, document analysis was conducted using a range of local materials, including temple archives, school curricula, municipal development plans, and local news coverage. These documents provided historical and institutional context that helped trace the evolution of collaborative governance and policy alignment with sustainability efforts. In this way, the institutionalization of CECI principles could be examined over time.

Finally, the research incorporated international reflections collected during the UN-SDGs Bootcamp and Forum, in which 70 global participants engaged with the community over four days. These reflections were gathered through semi-structured interviews and focus group discussions and served both to validate the findings and to assess the broader applicability of the CECI model across cultural contexts.

Data analysis was conducted using thematic analysis informed by Braun and Clarke's (2006) method. Interview transcripts, observation notes, and document excerpts were manually coded using a structured framework derived from the core elements of the CECI model. The analysis revealed recurring patterns that were synthesized into three overarching thematic clusters: cultural and spiritual drivers of innovation, community-led environmental practices, and cross-sector collaboration. Each theme demonstrated how localized norms and shared values catalyzed sustainable behaviors, consistent with the theoretical logic of the framework.

To ensure trustworthiness, the study implemented member checking by presenting initial interpretations to key informants for feedback. Additionally, methodological triangulation across interviews, observation, documents, and international data sources enhanced the credibility of

the findings. Iterative readings and reflexive memoing were also employed to minimize researcher bias and reinforce analytical rigor.

Ultimately, the methodological flow of this study rooted in qualitative inquiry, multi-source triangulation, and thematic synthesis served not only to generate empirical insights but also to demonstrate the operational validity of the CECI framework within a real-world community context.

## Findings

This section presents the core findings from a rigorous thematic analysis of interviews, observations, document reviews, and international participant feedback. These findings are organized into three principal themes, each with associated sub-themes, to demonstrate the depth, credibility, and cultural embeddedness of circular innovation in the Bang Nam Phueng community.

### 1) Cultural and Religious Drivers of Innovation

Wat Chak Daeng serves as more than a religious institution; it is a hub for cultural transmission, behavioral transformation, and sustainability education. The temple's signature project transforming plastic waste into monk robes has become emblematic of how Buddhist philosophy can directly inspire environmental innovation. This initiative is not merely about recycling; it reframes waste as a source of merit, invoking the Buddhist principle of 'making merit' (tham bun) through acts that benefit both society and the environment. By converting discarded plastic into sacred material, the temple elevates the status of environmental action to that of a spiritual practice. Monastic leaders, particularly the abbot Phra Maha Pranom, play a pivotal role in linking Buddhist teachings with ecological responsibility. Through sermons, community workshops, and school partnerships, the temple disseminates messages that connect Dhamma principles with actions such as reducing consumption, separating waste, and restoring ecosystems. These teachings appeal deeply to community members because they resonate with moral values already embedded in their cultural and spiritual lives.

Interviewees consistently reported increased engagement and behavioral change due to this framing. Participants stated that the temple gave them moral motivation to act, not just a legal or economic one. This moral framing also helps normalize sustainable behaviors, making them part of community rituals and daily life. Moreover, the temple's role as a trusted and revered institution makes it uniquely positioned to lead change in ways that government or NGOs often cannot achieve alone. The credibility of this model is further reinforced by the visibility of

outcomes. Physical products like plastic robes act as tangible symbols of transformation. The process is participatory, with community members contributing plastic bottles and witnessing their transformation during temple ceremonies. This visibility helps reinforce the moral and communal aspects of innovation, thus building stronger social cohesion around sustainability goals.

The case of Wat Chak Daeng illustrates how religious institutions can shift public perception and behavior by embedding environmental practices within a spiritual and cultural framework. It offers a model that is highly relevant for other Buddhist-majority communities and demonstrates that sustainable development can be both sacred and practical.



**Figure 2:** Plastic bottles collected, sorted, and compacted at the Wat Chak Daeng recycling center. Students and vendors also participate in upcycling initiatives. Source: Ronnaphop (2025).

While the “plastic robes” initiative is a central example of the temple’s role in aligning spiritual values with environmental innovation, its detailed description has been consolidated to avoid repetition. The Findings section presents the case as an empirical observation, while the Discussion analyzes its theoretical implications within the CECI framework. This separation maintains analytical clarity and prevents redundancy, ensuring that each section fulfills its distinct purpose.

## 2) Community-Led Environmental Practices

The Bang Nam Phueng Floating Market exemplifies how community-led environmental innovation can be integrated into local economic and cultural systems. Far from being a conventional marketplace, it serves as a dynamic platform for educating residents and visitors on sustainable living. The layout of the market itself reflects principles of environmental design:

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waste sorting bins are clearly labeled and strategically placed; vendors are encouraged to reduce packaging; and community-wide initiatives promote a zero-waste ethos.

One of the most impactful initiatives is the community waste bank. This system enables households and vendors to deposit recyclable materials in exchange for points or income, which are reinvested into local development projects. Interview data revealed that over 80% of households in the vicinity participate regularly, reflecting high levels of buy-in. The initiative has reduced landfill waste significantly and improved local sanitation, particularly during market weekends when visitor numbers spike. Education is a central component of these efforts. Schools conduct field trips to the market, and local teachers collaborate with vendors and temple staff to develop sustainability curricula. EM ball workshops where participants make microbial cleaning balls to purify water are frequently held, attracting both children and adults. These workshops not only disseminate technical knowledge but also reinforce community bonds through shared, hands-on learning experiences.

What makes these practices sustainable is their grounding in local customs and informal governance structures. Community meetings are held monthly to discuss progress and adapt strategies. Vendors take turns managing waste stations, and volunteer networks mobilize during festivals and public holidays. This rotation system builds shared responsibility and ensures that sustainability is not perceived as a top-down mandate but a collective commitment. The findings show that community-led practices succeed when they are visible, participatory, and supported by both tradition and innovation. The market operates not just as a space of commerce but as a living demonstration of how environmental responsibility can be embedded into everyday life. As such, it offers a valuable reference point for other communities seeking to localize the SDGs through culturally attuned grassroots action.



**Figure 3:** International participants engaged in cultural and sustainability dialogue workshops at Wat Chak Daeng. Source: Ronnaphop (2025).

### 3) Cross-Sector and International Collaboration

Cross-sector collaboration forms the backbone of the success and sustainability of circular innovation in Bang Nam Phueng. The initiative thrives on dynamic partnerships that bridge diverse sectors including religious institutions, educational bodies, local government agencies, community vendors, and international stakeholders. These partnerships are not merely symbolic; they translate into coordinated actions, co-learning processes, and shared ownership of environmental goals. At the local level, temples, schools, and municipal bodies co-develop programs that emphasize sustainability. Monthly planning meetings are conducted in an open and participatory manner, enabling different community actors to contribute their perspectives and resources. For example, teachers incorporate Buddhist environmental teachings into their lesson plans, while local officials provide logistical and regulatory support. Vendors participate in program design by proposing practical solutions for waste management within the market. This structure facilitates both top-down and bottom-up feedback loops, ensuring that strategies are culturally appropriate, socially inclusive, and technically feasible.

A distinctive feature of this collaboration is the trust placed in religious leaders to act as conveners. The temple, particularly Wat Chak Daeng, plays a coordinating role that lends spiritual legitimacy to sustainability efforts. Participants across sectors described the abbot's involvement as a major influence in ensuring high community turnout, rule adherence, and moral alignment. In settings where secular governance structures may lack deep cultural penetration, spiritual institutions provide a foundation for sustained participation. The international dimension adds a further layer of credibility and transferability. During the Global Youth Leadership Programme: UN-SDGs Bootcamp & Forum 2025 Q2, Bangkok, 70 participants from 30 countries engaged in immersive fieldwork at Bang Nam Phueng. Through structured interviews, reflection sessions, and collaborative tasks, these participants shared their impressions and offered comparative insights. They praised the model for its adaptability, simplicity, and deep cultural anchoring features that make it replicable in various global contexts. Several participants from Southeast Asia, South Asia, and Africa expressed interest in piloting similar programs in their own religious or community centers.

Their observations added depth to the findings by framing local practices within a global dialogue. One notable comment described the initiative as “a form of spiritual infrastructure for the circular economy,” which underscores the conceptual innovation present in the Bang Nam Phueng model. External validation also served to motivate local stakeholders, who viewed international recognition as an affirmation of their cultural identity and environmental leadership.

This cross-sector and international engagement shows that circular innovation is not the exclusive domain of technical experts or policymakers. When diverse actors collaborate through shared values and mutual respect, solutions emerge that are context specific, scalable, and culturally powerful. This finding points to a broader implication: cultural institutions, when activated as convening forces, can accelerate the localization of the SDGs and amplify the voices of grassroots actors in global sustainability discourse.

These findings highlight how culturally contextualized practices and inclusive governance structures can drive effective, scalable, and spiritually resonant circular innovations. How culturally contextualized practices and inclusive governance structures can drive effective, scalable, and spiritually resonant circular innovations.



**Figure 4:** Participants from 30 countries engaging in small group discussions during the UN-SDGs Bootcamp Forum 2025. Source: Ronnaphop (2025).

### Discussion and Recommendations

The findings of this study underscore that sustainable transformation within local communities is most effectively achieved when circular economy (CE) practices are embedded within cultural, spiritual, and social frameworks. Rather than viewing sustainability as a technocratic or purely environmental issue, this research reconceptualizes it as a culturally mediated process anchored in ethical traditions, communal identity, and spiritual worldviews.

First, the **integration of Buddhist environmental ethics** was not a superficial narrative layer but a functional moral infrastructure that shaped environmental behavior. Concepts such as karma, non-harming, and moderation acted as internal motivators for sustainable action. By positioning waste as a form of “negative karma” to be purified through communal merit-making, the temple transformed abstract ecological goals into culturally resonant responsibilities. This finding reinforces claims by De Silva (2020) and others that religious belief systems can function as powerful normative frameworks for sustainability.

Second, the study highlights that **innovation emerges not only from technical expertise but from the co-creative capacity of communities**. In Bang Nam Phueng, circular practices were generated and maintained by diverse stakeholders through a bottom-up approach. These included EM ball production, recycling rituals, and local eco-tourism. Such initiatives are more likely to succeed because they align with everyday life and local wisdom. This supports Mont et al. (2021), who argue for the legitimacy and durability of citizen-driven innovation.

Third, **cross-sectoral collaboration was essential to institutionalizing change**. Temples acted as moral conveners, while schools, local governments, and market actors contributed logistical support and educational outreach. The triangulation of cultural authority, administrative structure, and social practice created a holistic ecosystem for sustainability. This reflects the importance of multi-actor governance models in achieving the SDGs, particularly Goals 11, 12, and 13.

From a theoretical perspective, compared to conventional Circular Economy (CE) models, which typically focus on optimizing material efficiency, minimizing waste, and closing resource loops through technological and market-based mechanisms (Geissdoerfer et al., 2020), the Culturally Embedded Circular Innovation (CECI) framework integrates cultural and moral dimensions as central drivers of change. By leveraging spiritual authority, community rituals, and moral narratives, CECI transforms sustainability from a compliance-driven activity into a value-based, participatory process. This moral integration provides greater social legitimacy and community ownership, which can be particularly advantageous in contexts where purely technical or regulatory approaches may have limited reach or acceptance.

This study highlights that bridging the gap between top-down policy frameworks and grassroots implementation requires not only administrative coordination but also cultural and moral integration. In the Thai context, spiritual institutions such as Buddhist temples play a pivotal role in translating national CE strategies into locally relevant actions. By leveraging moral authority, community trust, and ritualized environmental practices, these institutions serve as intermediaries that contextualize abstract policy goals into tangible, culturally resonant initiatives. Such mediation not only accelerates policy adoption but also enhances the legitimacy and sustainability of grassroots innovations.

**Recommendations** drawn from this analysis include:

1. Policymakers should integrate religious and cultural actors into environmental planning to foster legitimacy and participation.

2. Educators should build curricula that connect spiritual values with ecological practices to shape ethical environmental citizens from an early age.
3. Community leaders should be empowered to design sustainability solutions that reflect their cultural context rather than replicate external models.
4. Future research should test the adaptability of the CECI framework in other cultural or religious settings to evaluate its broader applicability.

In conclusion, this study demonstrates that culturally embedded innovation when co-produced through shared values and cross-sectoral trust offers a viable path for sustainable transformation in the Global South. The Thai case reveals a broader truth: that sustainable development cannot be imposed; it must be interpreted, translated, and embodied through local meaning systems.

### Implications and Benefits of the Study

This study offers key insights for advancing sustainability through culturally embedded approaches. By operationalizing the Culturally Embedded Circular Innovation (CECI) framework, it illustrates that effective circular economy practices in the Global South must align with local worldviews, institutions, and community dynamics. From a **policy perspective**, the research underscores the role of religious and cultural institutions, especially temples as credible agents for behavioral change. Their moral authority and social embeddedness can be leveraged to strengthen policy legitimacy and public trust in environmental programs.

In **education**, the findings suggest that integrating spiritual values into environmental curricula such as linking Buddhist ethics with waste separation and organic composting can enhance both environmental literacy and ethical reasoning among youth. For **community empowerment**, the study shows that innovation need not be imported from external actors but can arise from local wisdom and participatory processes. This challenges technocratic models and affirms the agency of grassroots actors in shaping their sustainability futures.

In the domain of **academic research**, the CECI framework contributes a novel interdisciplinary tool for understanding place-based circularity. It bridges spiritual ecology, grassroots innovation, and sustainability science thus opening new pathways for comparative research in culturally diverse settings. Finally, in terms of **international cooperation**, the case of Bang Nam Phueng demonstrates how localized, value-driven sustainability models can resonate globally. The enthusiastic reception by participants in the UN-SDGs Bootcamp affirms the potential of South-South knowledge exchange in scaling culturally adaptive practices.

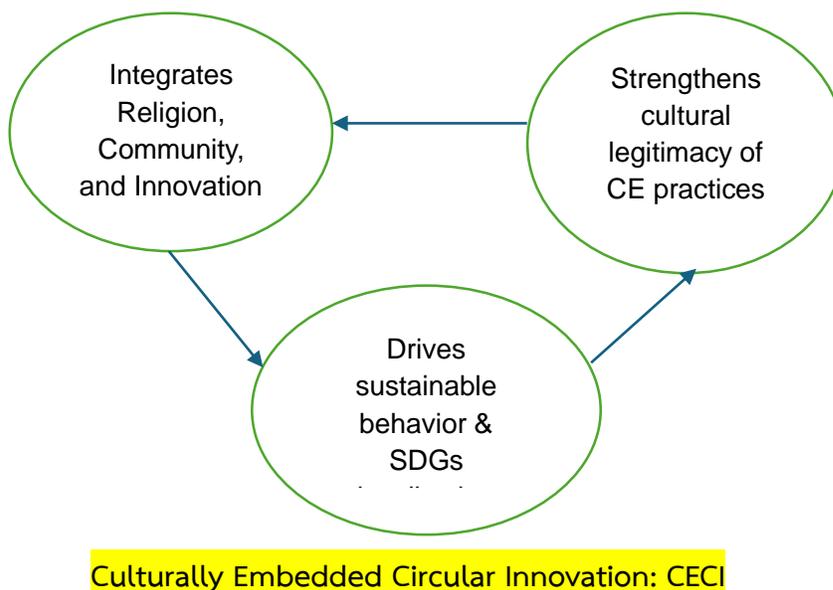
Beyond the immediate context, these findings offer broader implications for sustainability transitions in culturally diverse settings. By embedding CE principles within local moral systems and spiritual practices, policymakers and practitioners can enhance community ownership, increase resilience to socio-economic shocks, and foster long-term behavioral change. The CECI framework developed in this study can serve as a replicable model for integrating cultural dimensions into sustainability policies, particularly in regions where spiritual institutions hold significant social influence.

In summary, the study reinforces that sustainability transitions are most resilient when rooted not only in technical feasibility, but also in moral legitimacy and cultural relevance.

## Conclusion

This study investigated how circular economy (CE) principles can be localized through cultural, spiritual, and participatory practices in Thailand. Focusing on the Bang Nam Phueng community and Wat Chak Daeng, it employed an embedded case study design to explore how Buddhist environmentalism, grassroots innovation, and community co-creation support sustainability goals, particularly SDGs 11, 12, and 13.

Findings confirm that CE implementation, when embedded within the cultural and moral fabric of the community, produces outcomes that are both environmentally effective and socially resonant. Figure X presents a synthesized view of the Culturally Embedded Circular Innovation (CECI) model as validated by these findings. It shows how the integration of religion, community, and innovation strengthens the cultural legitimacy of circular economy practices, which in turn generates a reinforcing cycle that drives sustainable behavior and supports the localization of the Sustainable Development Goals (SDGs). This interdependent relationship underscores the model's potential for replication in culturally diverse contexts, where aligning sustainability initiatives with local values can significantly enhance community ownership and long-term impact. These findings validate the CECI (Culturally Embedded Circular Innovation)



**Figure 5:** presents a synthesized view of the Culturally Embedded Circular Innovation (CECI) model as confirmed by the study’s findings. It illustrates how the integration of religion, community, and innovation not only strengthens the cultural legitimacy of circular economy practices but also creates a reinforcing cycle that drives sustainable behavior and facilitates the localization of the Sustainable Development Goals (SDGs). This interlinked dynamic reflects the unique value of embedding circular innovation within cultural and moral frameworks, thereby enhancing both community ownership and long-term impact.

The study contributes theoretically to environmental humanities and spiritual ecology by demonstrating the integration of moral narratives with practical environmental action. Practically, it presents new avenues for collaboration between policymakers, educators, and spiritual institutions in designing culturally resonant sustainability strategies. While rich in contextual insights, the research is limited by its geographic and temporal scope. Broader validation of the CECI framework will require future research across different spiritual and social settings, as well as longitudinal assessments of behavioral outcomes.

In essence, the Bang Nam Phueng case affirms that sustainability need not be externally imposed but can grow organically from within through cultural relevance, moral guidance, and collective action. Such locally grounded models may hold the key to fulfilling the global aspirations of the SDGs.

### Limitations of the Study

Despite its contributions, this study presents certain limitations. First, its scope is limited to two embedded case studies within a single Thai community, which may constrain the generalizability of findings to other cultural or geographical contexts. Second, the fieldwork was conducted over a brief four-day period, offering a rich but time-bound snapshot of community practices rather than a longitudinal view of behavioral change. Third, the data analysis relied on manual thematic coding, which despite being rigorous and triangulated may still be influenced by researcher subjectivity. Lastly, the CECI framework, though effective in the Thai Buddhist setting, may require adaptation in other spiritual or institutional environments. Future research is encouraged to test its applicability across diverse contexts and over longer periods to assess its scalability and durability.

Beyond the methodological and temporal constraints noted, there are structural and policy-related challenges to the broader adoption of the CECI framework. These include limited integration of cultural actors into national sustainability strategies, inconsistent governmental funding for community-based environmental programs, and the absence of regulatory incentives that recognize and support faith-based innovation initiatives. Without institutional alignment, the scalability of such culturally embedded models remains contingent upon the voluntary commitment of local actors, which may fluctuate over time.

### Acknowledgment

During the preparation of this manuscript, OpenAI's ChatGPT (version June 2024) was used exclusively as a linguistic and structural refinement tool. It did not generate original research content, conduct analysis, or determine conclusions. All research design, data collection, interpretation, and final synthesis were carried out independently by the authors, who take full academic responsibility for the work.

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