

Co-Creating Sustainable Future Cities: An Innovative Participatory Planning Approach Using LEGO® Serious Play® in a Secondary City of Thailand

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ABSTRACT

Secondary cities in the Global South, which are home to over half of the world's urban dwellers, face governance gaps that hinder their sustainable progress. To address this gap, we evaluated an embodied, model-based participatory approach—LEGO® Serious Play® (LSP) combined with an Imaginary Future Generations (IFG) protocol—to improve clarity, inclusiveness, and long-term orientation in planning. This study unveils the power of LEGO® Serious Play® (LSP), complemented by Imaginary Future Generations (IFG), to inspire intergenerational perspectives in reimagining urban futures in Mae Hia Municipality, Thailand, a peri-urban secondary city in rapid flux. Using a mixed-methods design spanning 11 months, 40 diverse stakeholders joined structured workshops to co-create 20-year urban visions through three-dimensional model-building. The results revealed notable gains: 84% improvement in participation quality, 93% increase in creativity, and 79% flattening of the hierarchy ($\beta=0.78$, $p<0.001$). Thematic coding identified “embodied futuring” as the key mechanism for translating abstract sustainability concepts into tangible spatial plans. While outputs earned municipal praise and aligned with adaptation priorities, formal

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adoption lagged due to bureaucratic constraints. The innovative Participatory Planning Cycle bridges the vision–implementation divide, positioning secondary cities as vibrant innovation laboratories. This replicable framework advances sustainability science by democratizing complex planning through embodied cognition and by urging scholars to explore how secondary cities can advance sustainable urban governance worldwide.

Keywords: Participatory Urban Planning, Secondary Cities, LEGO® Serious Play®, SDG Localization, Future Design, Urban Governance Innovation, Embodied Cognition

1. Introduction

By 2050, two-thirds of the world's population will live in cities. Increasingly, it is the secondary cities—those vibrant hubs bridging the gap between large metropolises and rural communities—that are set to accommodate much of this urban expansion (Roberts, 2014). Mae Hia Municipality in Northern Thailand offers a telling illustration: rice fields coexist with new commercial districts, centuries-old temples neighbor bustling shopping centers, and some 27,000 residents manage their daily lives amid evolving infrastructure and growing flood risks. The everyday experiences of Mae Hia's citizens reflect the spatial and social complexities that are shaping many secondary cities worldwide.

However, the challenges confronting these cities extend beyond the physical landscape. Secondary cities now shelter over half the world's urban residents, yet they grapple with so-called “wicked problems” (Rittel & Webber, 1973): swift peri-urban expansion, emerging informal settlements, and persistent gaps in governance that do not yield straightforward solutions. Unlike megacities, secondary cities often operate with limited budgets, constrained technical expertise, and modest political leverage, even as they face the most rapid and profound transformations. This paradox of rapid change amidst limited capacity highlights the urgent need for governance approaches that are both creative and sensitive to local realities.

In seeking solutions, many city leaders have turned to participatory planning to broaden civic engagement and foster a sense of shared urban stewardship. However, the well-intentioned promise of participation is often difficult to achieve in practice. Such approaches often fall into the “participation paradox” (Umemoto, 2004): processes designed to include all voices may unintentionally reinforce existing power dynamics, leaving vulnerable groups unheard. To be more specifically, Critical scholarship warns that Western-designed participatory models can reproduce exclusions when transplanted into Global South contexts characterized by informality, linguistic diversity, and uneven literacies; without institutional reform and locally attuned facilitation, “invited spaces”

risk elite capture or tokenism (Watson, 2009; Umemoto, 2004). In the context of secondary cities in the Global South, additional barriers such as limited literacy, entrenched cultural norms, language diversity, and resource scarcity hinder inclusive participation (Watson, 2009). Conventional methods, such as community mapping, participatory budgeting, and stakeholder consultations, tend to favor those with higher technical or verbal skills, inadvertently excluding many who are most affected by planning decisions (Karanja, 2010; Cabannes, 2015). Simultaneously, these processes can struggle to look beyond immediate needs and often fall short of cultivating the long-term vision necessary for sustainability.

Recognizing these multifaceted challenges, this study explores a novel methodological approach that combines LEGO® Serious Play® (LSP) with Imaginary Future Generations (IFG). The LSP enables participants from all walks of life to “think with their hands”, breaking down barriers to expression and hierarchy through the co-creation of physical models (Schulz et al., 2015; Tewdwr-Jones & Wilson, 2022). Furthermore, Imaginary Future Generations (IFG) which was introduced by Saijo (2020) refers to deliberative protocols that ask present stakeholders to role-play and advocate for hypothetical residents 20–30 years ahead, thereby countering presentist bias and widening intergenerational perspectives. The IFG approach invites participants to actively consider the perspectives of future generations, helping to broaden the temporal horizon and encourage empathy for those who will inherit tomorrow’s cities (Saijo, 2020). Over the course of 11 months in Mae Hia, this research engaged 40 diverse stakeholders in co-creating 20-year urban visions, not simply as policymakers, but as neighbors committed to their city’s shared future. This study investigates three primary questions: 1) How and to what extent does LSP + IFG enhance the quality of participation, creative engagement, and future orientation in comparison to conventional meetings? 2) What mechanisms connect embodied model-building to inclusive, long-term urban visioning, referred to as “embodied futuring”? and 3) Under what institutional conditions do workshop outputs integrate into municipal processes, and what constraints limit their adoption?

2. Theoretical Framework

2.1 Secondary Cities as Complex Adaptive Systems

While the significance of secondary cities for global sustainability is widely acknowledged, understanding their governance dynamics requires moving beyond superficial typologies. These cities constitute a heterogeneous group—urban entities resisting classification, yet united by predicaments distinguishing them from megacities and rural towns. Roberts (2014) framework delineates four broad types: subnational cities that function as administrative capitals but lack substantive autonomy; city-cluster cities embedded within metropolitan networks and therefore challenged by identity formation; corridor cities located along transportation axes and shaped by linear growth pressures; and specialized-function cities that remain highly vulnerable to market volatility.

More significantly, this typological diversity also reveals deeper structural constraints that cut across categories. Roberts and Hohmann (2014) show that secondary cities often operate under severe fiscal dependence on central transfers, which in turn limits local innovation and policy flexibility. Moreover, they frequently possess weak administrative capacity, with planning offices staffed largely by generalists rather than technical specialists, a limitation that becomes especially consequential in the face of increasingly complex urban problems. In this circumstance, secondary cities occupy an intermediary governance space between rural and metropolitan models, and as a result, they are often left outside policy frameworks designed for either context.

Given these governance limitations, complexity theory offers a more productive analytical lens. Batty (2008) conceptualizes cities as complex adaptive systems in which dynamic interactions among actors and institutions generate emergent patterns over time. In secondary cities, this complexity is often intensified rather than reduced. Campbell (2012) demonstrates that informal networks may compensate for institutional weakness, while traditional authorities and civil society actors frequently fill governance vacuums. At the same time, historical legacies can produce path-dependent lock-in effects that reproduce spatial

inequality, and feedback loops between rapid urbanization and weak institutional capacity may further erode governance effectiveness.

Accordingly, the “in-betweenness” that characterizes secondary cities should be understood not as a temporary condition but as a defining structural feature. Cardoso and Meijers (2017) argue that such cities must continuously negotiate among rural and urban logics, informal and formal systems, and tradition and modernity, thereby requiring highly adaptive approaches to governance. Mae Hia Municipality exemplifies these theoretical dynamics in practice. Experiencing 4.5% annual growth, in contrast to Thailand’s stagnating trend, Mae Hia embodies secondary city contradictions. With 129 staff, limited specialists, and budget dependency on transfers, Mae Hia represents both dynamism and constraints that define secondary cities globally. Thus, Mae Hia serves as a microcosm and testing ground where creative, contextually grounded solutions become imperative for addressing the governance challenges inherent to secondary city transitions.

2.2 Participation Theory and Methodological Innovation

The evolution of participation theory in urban planning reflects the persistent tensions between democratic aspirations and practical realities. Arnstein’s (1969) ladder of citizen participation remains foundational, exposing the gulf between tokenistic engagement and authentic citizen power. Her eight-rung framework revealed how participatory processes cluster near manipulation and therapy, rather than genuine citizen control. This critique is particularly salient in secondary cities, where resource constraints and limited administrative capacity reduce “participation” to mere information dissemination, reinforcing rather than challenging entrenched power dynamics.

Building on Arnstein’s critique, subsequent theorists have sought more transformative frameworks for authentic engagement. Healey (2006) emphasizes deliberative processes that value diverse forms of knowledge beyond technocratic expertise while highlighting the role of institutional design in mitigating power asymmetries. However, such ideals remain difficult to operationalize in contexts

characterized by structural inequality and limited resources. Accordingly, co-creation has emerged as a more recent paradigm, reframing citizens as active contributors to knowledge production rather than passive consultees (Puerari et al., 2018). Even so, structural barriers continue to constrain the transformative potential of these approaches in practice.

This evolution has generated sustained debate regarding whether participation can meaningfully transform governance. On the one hand, Fung (2006) argues that institutional design can operate as a critical lever for improving inclusivity, particularly through structured formats such as small-group deliberation and facilitated dialogue—an approach reflected in methods such as design charrettes and future workshops. On the other hand, Miraftab (2004) demonstrates that such invited spaces frequently reproduce elite dominance when participation depends on cultural and educational capital, a limitation evident in expert-driven formats and literacy-dependent tools such as community mapping. Thus, these approaches, while procedurally robust, remain vulnerable to the very inequalities they seek to address.

In response to this impasse, Varela, Thompson, and Rosch (1991) introduce the “embodied turn,” reconceptualizing cognition as inseparable from lived experience and thereby opening pathways for more inclusive, non-verbal, and experiential forms of engagement. Building on this foundation, Tewdwr-Jones and Wilson (2022) demonstrate how LEGO-based co-design exercises fostered substantive collaboration and idea generation across diverse urban stakeholders, validating the method’s applicability in planning engagement.

Table 1 clarifies this methodological landscape by comparing the mechanisms, strengths, limitations, and relevance of participatory methods to secondary city contexts, positioning LSP within broader participatory traditions while highlighting its potential to address persistent challenges.

Table 1: Comparative Analysis of Participatory Methods

Method	Core Mechanism	Strengths	Limitations	Application in Mae Hia
Community Mapping	Spatial data collection	Captures local knowledge	Requires literacy	Not applied
Participatory Budgeting	Resource allocation voting	Transparent	Limited to finances	Not applied
Design Charrettes	Collaborative design sessions	Rapid ideation	Expert-dominated	Elements in LSP
Future Workshops	Structured visioning exercises	Action-oriented	Abstract discussions	IFG integrated with LSP
LEGO Based	3D tactile modeling	Inclusive, hierarchy-flattening	Resource-intensive	Core methodology

Source: Author’s elaboration

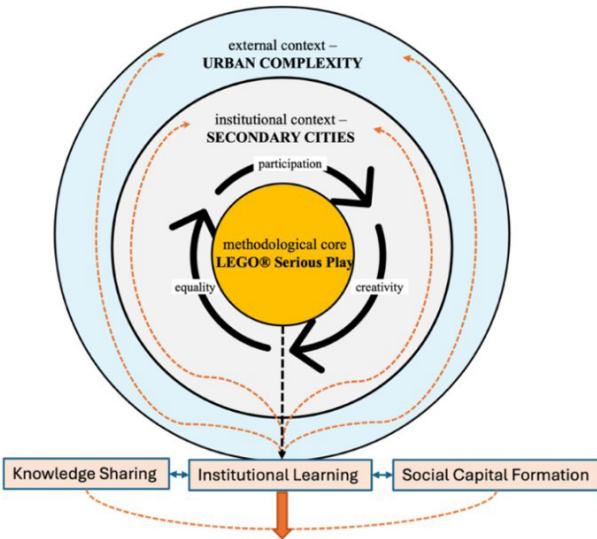
2.3 Temporality and Future-Oriented Governance

Sustainable urban planning fundamentally requires managing temporality; decision-makers must transcend immediate pressures to shape cities for future generations. However, Weber (2006) identifies a “presentist bias”, whereby short-term political cycles and operational demands eclipse strategic visioning. This predicament intensifies in rapidly transforming secondary cities, where municipal leaders confront daily crises, including flooding, infrastructure failure, informal settlements, and congestion. The institutional bandwidth consumed by these challenges leaves minimal capacity for imagining distant futures. This temporal myopia proves problematic for climate adaptation and infrastructure investment, where today’s decisions carry irreversible consequences extending decades ahead. Questions of intergenerational equity receive only rhetorical attention, remaining peripheral to actual policy choices.

To address these temporal limitations, scholars have proposed divergent strategies for embedding long-term perspectives into governance. Thompson (2010) argues for formal institutional mechanisms—such as constitutional environmental guarantees, sovereign wealth funds, and mandatory impact assessments—to secure the interests of future generations. He critiques voluntary approaches, arguing that only structural reforms compel leaders to prioritize future interests. Conversely, Kamijo et al. (2017) and Saijo (2020) develop a psychological–deliberative approach through Imaginary Future Generations (IFG) and Future Design, showing that role-playing as future residents can strengthen support for long-term sustainability policies even when these conflict with immediate interests (Hara et al., 2019). Nevertheless, Flyvbjerg (2014) cautions that future-oriented reforms remain vulnerable to elite capture, as powerful actors may invoke long-term benefits to legitimate present interests while preserving existing asymmetries. However, implementation remains problematic, regardless of the approach.

These theoretical tensions become acute in secondary cities, where resource scarcity compounds planning challenges. In Mae Hia, the challenge transcends technical procedures: creating cognitive and institutional space for engaging distant futures amid present uncertainties while meaningfully engaging diverse stakeholders preoccupied with immediate survival issues. Our study proposes a novel method to address these constraints. By integrating LEGO® Serious Play® with IFG, we create “embodied futuring.” Drawing on embodied cognition theory (Barsalou, 2008), this approach enables participants to externalize and manipulate abstract temporal concepts by building spatial models. Constructing three-dimensional models allows stakeholders to concretize, assess, and negotiate complex scenarios, particularly empowering those lacking technical vocabulary. This methodology offers promising pathways for overcoming the temporal and participatory constraints that plague secondary city planning.

Figure 1: Conceptual Framework of LSP in Secondary City Governance



Source: Author’s elaboration

The conceptual framework underlying this study is illustrated in Figure 1, which situates the LSP at the heart of secondary city governance, mediating between foundational principles and participation, equality, and creativity—and the broader institutional and urban complexities in which planning is embedded. By explicitly linking methodological innovation to the demands of urban governance, this framework not only clarifies our theoretical orientation but also foregrounds the potentials of LSP to bridge the gap between individual imagination and systemic transformation, providing a robust foundation for the empirical investigation that follows.

3. Methodology

3.1 Research Design

This study employed an explanatory sequential mixed-methods design (Creswell & Plano Clark, 2017) to holistically examine both the quantifiable outcomes and interpretive depth of participatory planning innovation. Rooted in

pragmatist epistemology, this approach values methodological pluralism as essential for understanding complex social phenomena. The sequential structure was purposefully chosen to allow for the measurement of LEGO® Serious Play® (LSP) effects on participation using initial quantitative data, while subsequent qualitative enquiry explored the mechanisms and contextual factors underlying these outcomes. This dual strategy was particularly suited to the study of embodied participation, where tactile engagement and collective creativity often elude standardized metrics. Additionally, the research was conducted in three systematically integrated phases, each building upon the last to construct a comprehensive analytic narrative.

We employed an explanatory sequential mixed-methods design, executed in a chronological sequence. Phase 1, conducted in May 2024, involved the implementation of a case study focused on Language for Specific Purposes (LSP) workshops, which served as the primary intervention and data collection event. During this phase, a multimodal evidence base was constructed through participant surveys, structured observations, time-lapse photography, and audio recordings, culminating in a comprehensive, triangulated archive. Phase 2, spanning from May to December 2024, entailed a longitudinal follow-up using semi-structured interviews and institutional ethnography to examine early institutional effects. Phase 3, conducted in March 2025, involved a comparative analysis of four conventional municipal meetings, employing matched observational protocols to benchmark participation and temporal orientations.

3.2 Case Selection and Participants

The Mae Hia Municipality was purposively chosen as a “critical case” (Yin, 2018) using explicit theoretical and practical criteria. Theoretically, Mae Hia exemplifies a Type 2 city cluster settlement (Roberts, 2014), experiencing rapid growth (4.5% annually) amid limited institutional capacity (129 total staff, 6–8 planners), thus offering a robust test of participatory innovation under typical secondary city constraints. Practically, Mae Hia’s established partnership with Chiang Mai University, prior community engagement experience, and openness to methodological experimentation created optimal conditions for implementation while avoiding selection bias toward only “model” cities.

Participant recruitment followed a stratified purposive sampling strategy to ensure diversity and representativeness. Forty individuals were identified in partnership with municipal leaders, spanning five stakeholder categories: public officials (n=8), community leaders from all ten subdivisions (n=10), private sector actors (n=8), civil society (n=6), and educators/youth (n=8). Demographic analysis confirmed diversity across age (24–67, mean=43.5), gender (45% female), education (15% primary, 35% vocational, 40% university, 10% informal), and occupation (farmers, vendors, teachers, officials, business owners, students), with balanced representation from both commercialized and agricultural neighborhoods. This breadth of backgrounds proved essential for critically examining the LSP’s ability to bridge literacy, status, and spatial divides.

3.3 Workshop Design and Implementation

The six-hour LSP workshop, conducted on 20 May 2024 was carefully piloted and refined in collaboration with Thammasat University graduate students to ensure cultural relevance and effective facilitation, drawing on documented LSP design principles (Zenk et al., 2018). The agenda scaffolded complexity to enable inclusive and sophisticated outputs. The session began with icebreakers and LSP familiarization (45 min) using basic building tasks to promote psychological safety. Temporal Mapping (80 min) followed, prompting participants to model Mae Hia’s past, present, and envisioned future, with deliberate constraints on LEGO elements to stimulate metaphorical and symbolic thinking. The core segment, Collaborative Scenario Construction (120 min), had mixed stakeholder groups negotiate and build collective 2044 visions, with protocols enforcing equitable participation and creative co-ownership of the vision. Democratic Deliberation (60 min) transformed static models into dynamic group narratives, employing performative storytelling from the perspectives of imagined future residents. The workshop closed with Consensus Formation (45 min), using participatory voting to identify and integrate preferred scenario elements into a collective vision.

3.4 Data Collection and Analysis

A systematic multimodal data strategy captured the full spectrum of participation dynamics. Pre-workshop, baseline conditions were established through ethnographic observations of four municipal meetings, visual documentation, and analysis of planning records (2019–2024). Workshop-phase data included post-event questionnaires ($n=36$, 90% response), validated participation and creativity scales, open-ended qualitative responses, 30-minute interval photography, 18 hours of audio recording and field notes on non-verbal and emotional dynamics. Although forty participants attended the workshop, only thirty-six completed the post-event survey, resulting in a 90% retention rate. The four non-respondents were part of the first cohort of the study. For the analysis of paired pre/post items, listwise deletion was employed for missing post-responses, and the sample sizes (N s) are reported for each test. Post-workshop impacts were traced via semi-structured interviews with staff ($n=2$) and diverse participants ($n=5$), alongside institutional ethnography tracking the use of LEGO models in policy and public settings.

Quantitative survey data were analyzed using SPSS v. 28, employing descriptive statistics, ANOVA (revealing no significant differences by age, gender, or background), and regression (creative engagement: $\beta = 0.78$, $p < 0.001$; hierarchy reduction: $\beta = 0.23$, $p < 0.05$). Exploratory factor analysis distinguished key participation quality dimensions—“voice” and “influence.” Qualitative analysis adopted Braun and Clarke’s (2012) reflexive thematic protocol, with dual coding (89% agreement) and member checking to ensure analytic rigor and validity. Through this layered, systematic approach, this study provides a robust, contextually grounded evaluation of embodied participatory planning in secondary cities.

4. Results

4.1 Envisioned Urban Futures

The LSP workshop produced eight distinct three-dimensional models, each representing a collective vision of Mae Hia in 2044. These models emerged from intense negotiations among diverse stakeholder groups, with each five-person

team required to integrate multiple perspectives to ensure a unified spatial narrative. Thematic analysis of model content, presentation narratives, and group discussions revealed sophisticated integration across economic, environmental, social, and cultural dimensions, demonstrating the participants' capacity for systems thinking when provided with appropriate methodological support.

Analysis of the thematic distribution across all eight models revealed the participants' priorities: social and cultural themes dominated at 40%, encompassing community cohesion, intergenerational connection, cultural preservation, and educational access. Economic themes comprised 35% of the studies, focusing on sustainable livelihoods, tourism development, digital innovation, and local entrepreneurship. Environmental themes, while representing 25%, appeared in every model, indicating the recognition of sustainability imperatives, even when not the primary focus. Notably, themes rarely appeared in isolation but were woven together, such as green infrastructure supporting environmental and social goals. Figure 2 visually exemplifies this integrative quality by presenting a selection of collaborative models as tangible artefacts of these priorities. The act of constructing three-dimensional models with LEGO bricks facilitated the expression and negotiation of these interconnected themes, enabling participants to externalize tacit knowledge and articulate multi-layered urban futures in accessible, non-verbal forms.

Figure 2 includes keyed annotations that link visible elements to analytic codes and intended functions: (A) "Mother Hia in the Dream"—1: canal spine and bridges (water governance, flood mitigation); 2: temple-as-learning hub (intergenerational digital/vocational skills); 3: green corridors (biodiversity, heat reduction, walkability); 4: digital literacy node (youth skills, entrepreneurship); 5: community market (local value chains). (B) "City of Eternal Joy"—1: sound-barrier forests (noise/air-quality mitigation); 2: quiet-zone pocket parks (mental health, respite); 3: sub-surface tourism/retail (low surface disruption); 4: heritage plaza (civic identity); 5: active-mobility loop (safe walking/cycling).

Figure 2: LEGO® Serious Play® Model Outputs



Source: Taken by the authors

Importantly, the substantive content of these models shows how the LSP enabled participants to operationalize complex ideas through embodied collaborative practice. For instance, “Mother Hia in the Dream” reimagines temples as multi-generational learning hubs, anchoring digital literacy, environmental education, and vocational training within a network of restored canals and green corridors—an embodiment of how social and environmental priorities can reinforce each other. This aligns with the Vibrant Vista City team’s discussion, where a public officer noted that “the temple is the center for everyone,” and an education-sector participant emphasized “restoring and re-using abandoned canals.” Together, these comments clarify why the participants positioned temples along a revitalized canal spine and linked them to community markets and skills nodes.

In a complementary vein, the City of Eternal Joy model responds to airport adjacency by integrating sound-barrier forests and quiet zones to mitigate aircraft noise, while placing tourism infrastructure underground to minimize surface

disruption and maintain neighborhood tranquility. This was articulated by a private-sector participant who described “the problem from the airport—aircraft noise,” and by an NGO participant who framed the desired outcome as “keeping the environment calm, without flight noise.” Emerald Oasis Metropolis advances an environmental agenda by allocating approximately 40% of the land to green spaces that support biodiversity, food security, and renewable energy, alongside expectations that urban businesses adopt cleaner practices. An NGO participant captured the rationale as “expanding green areas—the city’s lungs,” and outlined a two-zone layout to “increase green space and include a high-quality health center.”

Collectively, these models highlight the capacity of embodied participatory methods to unlock systems thinking among diverse stakeholders, advancing integrated visions that simultaneously address social, economic, and ecological priorities. Thus, the workshop outputs, as captured in both thematic analysis and visual representations, provide compelling evidence for the potential of LSP to inform holistic, community-driven urban governance in secondary cities.

4.2 Quantitative Assessment of Participation Quality

Post-workshop surveys (n=36) provided robust quantitative evidence of the LSP’s effectiveness in enhancing participatory planning. The results demonstrated consistently high ratings across all measured dimensions, with no significant demographic variations, suggesting the methodology’s inclusive reach across Mae Hia’s diverse stakeholder landscape.

Table 2: Participant Assessment of Workshop Outcomes

Dimension	Mean Score (SD)	% Agree/Strongly Agree
Creative Engagement	4.53 (0.52)	93%
Overall Satisfaction	4.42 (0.61)	89%
Participation Quality	4.21 (0.68)	84%
Future Orientation	4.17 (0.69)	81%
Hierarchy Reduction	4.08 (0.74)	79%

Source: Author’s elaboration

Creative Engagement scored highest, with 93% of participants agreeing that LSP enabled them to express ideas they “couldn’t put into words.” A 67-year-old farmer elaborated, “My hands know things my mouth cannot say. When I built the water system, I showed knowledge from 40 years of flooding that no report captures.” This finding validates the application of the embodied cognition theory to participatory planning.

4.3 Comparative Analysis with Conventional Planning

To articulate the value and distinctiveness of the LSP workshop more clearly, we systematically compared its outcomes and dynamics with those of a conventional planning meeting held in the same context. This side-by-side analysis highlights not only the methodological contrasts but also the qualitative and quantitative differences in the participation, communication, and visioning outcomes. The following table summarizes the key findings across the core dimensions:

Table 3: Comparative Analysis of Participatory Approaches

Dimension	Conventional Meeting	LSP Workshop	Observed Differences
Communication Pattern	70% official speaking	75% participant-driven	Reversed power dynamics
Idea Generation	47 discrete requests	8 integrated visions	Holistic thinking
Temporal Orientation	95% within 2 years	80% future-focused	Extended horizons
Participation Breadth	40–50% of participant	100% contributed	Universal engagement
Cross-Sector Exchange	Village-based silos	Mandatory mixing	Boundary crossing
Output Format	Listed requests	Visual models with priorities	Actionable artifacts

Source: Author’s elaboration

4.4 Emergent Mechanism: Embodied Futuring

Thematic analysis identified “embodied futuring” as the core transformative mechanism driving the workshop’s outcomes, operating through the synergistic interplay of cognitive integration, material mediation, and collective emergence. Participants engaged multiple forms of intelligence in tandem: spatial reasoning was activated through hands-on model construction, narrative intelligence emerged in storytelling, emotional intelligence was exercised during negotiation, and temporal intelligence was invoked in envisioning long-term future. This multimodal engagement fostered insights and creative breakthroughs that would have been difficult to achieve through verbal methods alone. Central to this process was the material mediation afforded by LEGO bricks, which acted as “thinking partners”—their modularity, color coding, and three-dimensional qualities allowed participants to externalize, manipulate, and iterate on abstract ideas in tangible form. Many described “thinking with their hands”, discovering novel solutions, and making connections during the building process itself rather than articulating fully formed concepts from the outset. Furthermore, the collective nature of model building fostered group dynamics that enabled outcomes surpassing individual contributions; physical experimentation often resolved disagreements more effectively than verbal debate, catalyzing transformative learning and systems thinking at the group level. In summary, embodied futuring enacted through the LSP methodology facilitated a unique and powerful mode of collaborative urban visioning that transcended conventional participatory limitations.

4.5 Implementation Challenges and Opportunities

Seven-month follow-up interviews revealed nuanced dynamics during the implementation phase. Municipal officials expressed strong enthusiasm for the LSP approach, highlighting three core differentiators from conventional consultations: the capacity to envision long-term futures beyond the typical one- to two-year horizons, the ability to refresh stakeholder engagement through playful and creative methods, and the production of actionable visual outputs. Nevertheless, officials also pointed to several barriers that constrain the immediate

integration of workshop outcomes, including misalignment with existing institutional planning cycles (which often span two to three years), uncertainties introduced by political transitions, the need to comply with regulatory frameworks, and ongoing budget constraints for innovative projects.

5. Discussion

5.1 Theoretical Contributions

This study offers a substantive advancement in participatory planning theory by empirically demonstrating the transformative power of “embodied futuring” as a participatory method. Moving beyond the limitations of verbal-centric participation, a long-standing critique in planning theory (Arnstein, 1969; Umemoto, 2004), the Mae Hia case reveals how physical model building through LEGO® Serious Play® enables diverse participants to access and articulate complex, future-oriented urban visions. This is not merely a matter of facilitating creative engagement; it represents a paradigmatic shift in the production and sharing of planning knowledge is produced and shared. As participants navigated tactile, collaborative problem-solving, they were able to “think with their hands”, giving form to ideas that might otherwise have remained tacit or excluded because of literacy or language barriers. This operationalizes and extends embodied cognition theory (Barsalou, 2008) into the temporal and collective domains of urban planning, providing a practical countermeasure to the “presentist bias” that Weber (2006) described.

Importantly, the role of LEGO models as boundary objects (Star & Griesemer, 1989) emerges as a critical bridging mechanism between community visioning and policy translation. Unlike traditional meeting notes or verbal proposals, these three-dimensional, visually intuitive models offer interpretive flexibility and material persistence, making them accessible to both lay stakeholders and municipal officials alike. As evidenced by Mae Hia’s planning department, the models’ visual and symbolic clarity supported new kinds of dialogue and decision-making, effectively narrowing the chronic gap between participatory engagement and formal implementation of the project. This mechanism adds empirical weight to

the theoretical literature on transformative capacity (Wolfram, 2016), suggesting that well-designed participatory tools can activate and sustain collective intelligence in complex governance environments.

Furthermore, the Mae Hia case underscores that embodied futuring is not merely about inclusion; it catalyzes systemic and creative thinking, as evidenced by the emergence of multisectoral, integrative visions for the city's future. The spontaneous blending of social, cultural, environmental, and economic priorities in the participants' models demonstrates how tactile engagement can move planning processes beyond sectoral silos and linear thinking. Thus, this research aligns with the ambitions of the New Urban Agenda and the SDGs, providing a grounded, replicable pathway for cities seeking to localize global sustainability frameworks through truly inclusive, creative, and future-oriented processes.

5.2 Secondary Cities as Innovation Laboratories

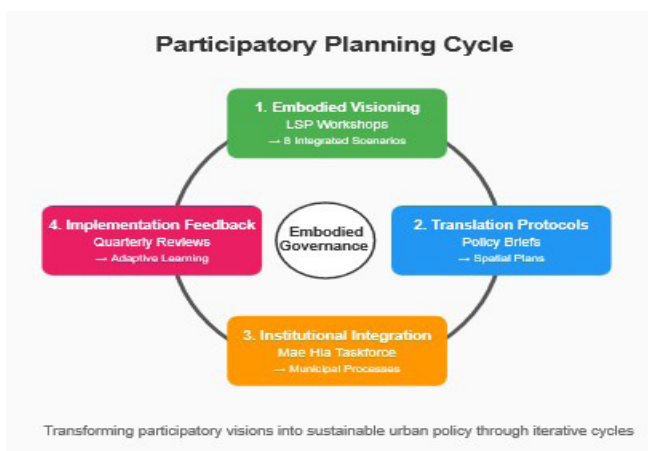
Equally compelling is this study's contribution to reimagining secondary cities not as passive recipients of urban best practices but as active laboratories of governance innovation. Mae Hia's experience vividly demonstrates that characteristics often considered liabilities—such as limited scale, constrained resources, and institutional fluidity—can, under the right conditions, serve as catalysts for adaptive experimentation and creativity. Within the workshop context, close social ties fostered trust and candid dialogue, whereas resource constraints drove urgency and pragmatic collaboration. Moreover, municipal openness to novel participatory approaches accelerates learning and adaptation. This dynamic aligns closely with the “edge of chaos” concept in complexity theory (Kauffman, 1995), which suggests that systems poised between rigidity and disorder are most conducive to innovation.

At the heart of these findings is the Participatory Planning Cycle developed in this study, which provides a concrete, actionable model for secondary cities seeking to bridge the persistent gap between visionary participation and policy implementation. As illustrated in Figure 3, the model unfolds through four

adaptive phases: embodied visioning, translation protocols, institutional integration, and, finally, iterative feedback. Unlike one-size-fits-all prescriptions, this framework is designed to be flexible, accommodating the unique contexts of different city types, political cultures, and administrative arrangements, as further evidenced in Table 3. What emerges is secondary cities, far from being merely transitional, are pivotal arenas where global lessons can be locally reinterpreted, tested, and scaled for broader impact.

Taken together, these contributions push the boundaries of participatory planning theory while inspiring a more optimistic, generative vision for urban governance—one in which cities of all sizes and capacities can become engines of sustainable transformation through creative, embodied and democratic practice. By operationalising the integration of community visions into formal policy cycles, the Participatory Planning Cycle (Figure 3) not only advances theory but also provides a practical roadmap for institutionalising innovation, building adaptive capacity, and sustaining participatory urban management, especially in the rapidly evolving and resource-constrained landscapes that define today’s secondary cities.

Figure 3: The Conceptual Model of Participatory Planning Cycle



Source: Author's elaboration

5.3 Scaling Considerations and Constraints

Scaling the LSP approach holds immense promise but requires navigating a complex tapestry of interconnected challenges. Resource constraints, such as the costs of materials, suitable venues, and time commitment, can appear daunting. However, these obstacles also invite innovation, such as simplified kits, strategic partnerships with schools, and the development of modular, shorter sessions, all of which present opportunities to lower barriers and broaden access. Equally essential is the cultivation of skilled facilitators who are not only adept at the method but are attuned to the unique cultural landscapes of each community. Investment in train-the-trainer programs and collaborative local co-design can empower communities to sustain this approach from within. While institutional inertia and skepticism toward “playful” methods may initially slow adoption, reframing LSP as “serious modeling” and incrementally weaving it into established processes can gradually shift mindsets and unlock its transformative potential. Addressing the risks of elite capture and ensuring genuinely inclusive participation will require a conscious effort; expanding digital and hybrid formats can amplify marginalized voices. Above all, recognizing and adapting to local cultural norms through context-specific protocols will be crucial in making LSP not only scalable but also truly effective across diverse urban environments.

Our findings in Mae Hia Municipality offer a hopeful glimpse into what is possible when participatory planning is approached as both science and art. The LSP and IFG combination produced clear, measurable gains: 84% of participants reported improved engagement, 93% experienced heightened creativity, and power hierarchies visibly flattened. More importantly, “embodied futuring” emerged as a mechanism for bridging divides of literacy, status, and even time itself, enabling community members to see themselves not merely as stakeholders but as architects of their shared urban future. These outcomes reveal that the constraints often associated with secondary cities—limited resources, smaller scale, and fluid institutions—can become drivers of governance innovation when paired with creative, inclusive tools.

The implications of this study extend from local to global. At the municipal level, the Participatory Planning Cycle piloted in Mae Hia transformed isolated consultations into a dynamic, ongoing process, as evidenced by the municipality's establishment of the Vision 2044 Task Force. At the national and international scales, research suggests that supporting methodological experimentation and recognizing diverse participation outputs can unleash local ingenuity and shift the paradigm from rigid best practices to vibrant, context-driven learning. While the study's limitations—such as the short follow-up period, the distinctiveness of Mae Hia's context, and the resource intensity of facilitation—must be acknowledged, they highlight urgent avenues for further research: comparative studies, longitudinal tracking, and experimentation with hybrid digital-physical models.

Ultimately, the significance of this work lies in its demonstration that democratic urban futures are not only possible but already emerging—brick by colorful brick—where communities are trusted with the tools to imagine and build. In a moment of global democratic uncertainty and accelerating environmental change, the collaborative spirit and imaginative courage shown by Mae Hia's farmers, vendors, youth, and elders offer a powerful reminder that urban sustainability is not a technical fix but a collective journey. As one grandmother from Mae Hia movingly observed, “I never thought my ideas mattered for the city's future. But look—my small green garden connects to her market, his technology center and their flood system. Together we built something beautiful that works.” In these acts of collective creation, hope is not just imagined but made real, a living testament to what cities can become when everyone is invited to help shape the future.

5.4 The Critical Role of Skilled Facilitation

The outcomes observed in this study should not be attributed to the method alone. Skilled facilitation mediated status differences, structured equitable turn-taking, and translated metaphors into a shared spatial language. Protocols such as mixed-stakeholder seating, timed build-talk cycles, and rotating narrators

countered deference to officials and amplified the quieter voices. This aligns with critiques that participatory formats without attention to power and process design risk reproducing existing hierarchies (Umemoto, 2004; Cooke & Kothari, 2001). For replication, we recommend (i) a facilitator-to-participant ratio of ~1:10, (ii) a short “micro-training” on metaphor-to-policy translation for facilitators, and (iii) pre-agreed escalation paths for conflict handling during model negotiations.

6. Conclusion, Policy Implications, and Limitations

This study contributes to participatory planning scholarship on several interrelated fronts, offering both conceptual innovation and empirical grounding in the context of secondary cities. First, our findings robustly validate the potential of “embodied futuring’s methodological breakthrough that overcomes the persistent limitations of verbal-centric participation. The Mae Hia workshop clearly demonstrated how tactile model building with LEGO® Serious Play® (LSP) allowed even those with limited formal education to co-create sophisticated urban visions, thus extending embodied cognition theory (Barsalou, 2008) into the domain of long-term, intergenerational planning and offering a practical response to presentist bias (Weber, 2006). These physical models became powerful “boundary objects” (Star & Griesemer, 1989), serving as interpretively flexible tools that facilitated translation between grassroots visioning and municipal policymaking. In our design, the LSP was paired with the Imaginary Future Generations (IFG) perspective to orient participants toward long-range, intergenerational responsibility, further tempering near-term biases and anchoring collective commitments. The combination of aesthetic accessibility and material persistence enables ongoing reference points in policy dialogues and grant proposals, effectively bridging the oft-cited gap between participatory engagement and formal implementation.

Equally compelling, this study reframes the narrative surrounding secondary cities—not as passive recipients of “best practices” but as active laboratories of governance innovation. Mae Hia’s experience illustrates how common constraints—modest scale, resource scarcity, and institutional fluidity—can catalyze rather than

hinder adaptive experimentation. Relational proximity fostered trust and open dialogue, whereas resource limitations accelerated pragmatic and creative problem-solving. The municipality's openness to new methods further enabled rapid adaptation and learning, resonating with the complexity theory's "edge of chaos" hypothesis (Kauffman, 1995). The Participatory Planning Cycle developed here—comprising embodied visioning, translation, institutional integration, and feedback—offers a replicable and adaptive roadmap for secondary cities aiming to bridge the vision-implementation gap. As Table 5 demonstrates, this model is not prescriptive but rather context-sensitive and adaptable to varied political cultures and administrative structures. These findings expand the theoretical and practical boundaries of participatory planning, pointing to a more generative and hopeful future for urban governance in resource-constrained settings.

The policy implications of this research are substantial. At the municipal level, the study recommends building hybrid governance structures that facilitate sustained engagement through partnerships with universities and local organizations, mirroring Mae Hia's creation of a Sustainable Taskforce and the involvement of student facilitators. National and regional authorities should consider revising planning regulations to recognize and integrate diverse participation outputs, including visual and narrative formats, thus amplifying the reach and impact of innovative participatory methods. Funding support for facilitator training and digital adaptation can further enhance capacity, especially in under-resourced municipalities. International agencies should pivot from prescribing standardized toolkits to empowering local experimentation and providing flexible resources for secondary cities to trial and refine embodied methods, such as LSP. Simultaneously, LSP + IFG resonates with SDG 11—particularly Target 11.3 on inclusive urban planning—and aligns with Thailand's national development strategy on people-centered participation and balanced regional development, strengthening the pathway from workshop outputs to programmatic action.

Despite these advances, some limitations remain. A solitary case study with a seven-month follow-up period captures only the initial enthusiasm, limiting the assessment of institutionalization and long-term impacts on urban

development. The supportive leadership and cultural context of Mae Hia may not translate to cities with more hierarchical or conflict-driven governance structures. Furthermore, while the workshop achieved 100% hands-on participation, challenges persist regarding inclusivity, particularly for elderly participants with literacy barriers, and in scaling up engagement to city-wide processes. Methodologically, reliance on self-selected participants and the lack of a control group restricts the causal attribution of observed outcomes to LSP alone. These factors qualify the transferability of the findings and call for cautious interpretation beyond similar secondary city settings.

Future research should address these limitations through multi-site comparative studies across Roberts (2014) typology of secondary cities, longitudinal evaluations of policy adoption, and hybrid approaches that integrate physical and digital participation. Priority areas include cost-effectiveness analyses and facilitator capacity models that reduce resource intensity while maintaining depth and inclusivity. A critical investigation into the role of facilitators and power dynamics within embodied participation processes is also warranted to ensure genuine inclusivity and avoid replicating existing exclusions.

In summary, this study advances participatory planning theory and methodology and provides actionable frameworks and policy guidance for secondary cities navigating complex urban transitions. By linking LSP + IFG to SDG 11 and Thailand's strategy—while naming the study's limitations—we enhance transparency and policy salience for practitioners working at the research-practice interface. By demonstrating that embodied, playful, and collective approaches can democratize urban futures, this research offers a replicable, hopeful vision: cities built by many hands, thoughtful heads, and caring hearts—one brick at a time.

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