IASP 2025 Beijing
42nd IASP World Conference on Science Parks & Areas of Innovation

Driving Sustainable Urban Development: The Role of STeP in Shaping Northern Thailand's Economic Future

BREAKOUT SESSION 2 – BUILDING FOR TOMORROW – DEVELOPING THE INFRASTRUCTURE OF INNOVATION SPACES

Author(s): Associate Professor Dr. Pitiwat Wattanachai[1], Dr. Nattida Tachaboon[1], Assistant Professor Dr. Suriyah Thongmunee[1], Dr. Takron Opassuwan[1]
[1]Science and Technology Park, Chiang Mai University, Thailand

EXECUTIVE SUMMARY

Chiang Mai University's Science and Technology Park (STeP) plays a crucial role in driving urban transformation and economic development in Northern Thailand. As urbanization accelerates, cities face challenges such as environmental degradation, traffic congestion, and social inequality. To address these issues, STeP integrates technological innovation, industry-academic collaboration, and strategic planning to foster a knowledge-driven economy. Aligning with the Northern Economic Corridor (NEC) and NEC-Creative LANNA initiatives, STeP advances smart infrastructure, mobility solutions, and digital transformation to strengthen the region's creative, tourism, agriculture, and digital industries. Through stakeholder engagement, it enhances university-industry linkages, promotes technology transfer, and supports startup incubation. Key initiatives include smart city solutions across multiple provinces, such as the MooVe project in Lampang, which improves urban mobility through data analytics and IoT technology. STeP also established the BCG Innovation Headquarters to promote sustainable business models while merging cultural heritage with modern technology. Moving forward, STeP aims to expand international partnerships, attract investment, and strengthen policy-driven support for science parks and smart cities. These strategies will position Northern Thailand as a hub for sustainable innovation, fostering economic resilience, technological advancement, and inclusive urban growth.

I: INTRODUCTION

Urban development worldwide is undergoing a significant transformation driven by technological advancements, sustainability goals, and the increasing emphasis on knowledge-based economies. Smart cities, digital economies, and innovation hubs have become central to modern urbanization, fostering economic growth while addressing pressing challenges such as environmental degradation, traffic congestion, and social inequality. In this evolving landscape, Science Parks, particularly University Science Parks, play a pivotal role in bridging the gap between academic research and real-world applications. These parks facilitate the commercialization of innovation, driving both economic growth and societal progress by leveraging the extensive resources of academic institutions.

In Thailand, University Science Parks have emerged as key drivers of economic advancement, with Chiang Mai University's Science and Technology Park (STeP) at the forefront of these efforts. Established in 2012, STeP has become a central hub for innovation and entrepreneurship, not only within Chiang Mai but also across Northern Thailand. The park has pioneered initiatives that integrate people, industry, and the city into a cohesive, innovation-driven ecosystem.

This paper examines the contributions of university science parks to urban development by fostering collaborations between academia, government, industry, and local communities. By adopting a holistic approach that integrates smart infrastructure, mobility solutions, digital transformation, and sustainable industries, it explores the role of STeP as a facilitator of economic resilience, technological innovation, and sustainable development. The study highlights STeP's strategic initiatives, including programs aimed at enhancing smart city infrastructure, supporting local entrepreneurs, and promoting sustainable business models. Furthermore, the paper analyzes how these elements collectively contribute to addressing regional challenges, fostering inclusive economic growth, and strengthening industry-academic collaboration. Within this broader framework, the discussion also focuses on the challenges and opportunities presented by the Northern Economic Corridor (NEC) and the NEC-Creative LANNA strategy, emphasizing how STeP's role supports policy-driven urban innovation and sustainable community development.

NEC-Creative LANNA is a spatial planning initiative by the Thai government designed to address poverty reduction, income distribution, and economic growth. It leverages Northern Thailand's unique cultural and creative strengths to drive economic advancement through four key industries: the digital industry, the creative industry, the tourism and wellness industry, and the agriculture industry. STeP plays a crucial role in aligning its initiatives with NEC-Creative LANNA, fostering synergies that integrate technological advancement with cultural heritage, sustainability, and local economic empowerment.

II: THE ROLE OF STEP IN URBAN DEVELOPMENT

Urbanization in Northern Thailand presents both opportunities and challenges. While economic expansion, technological advancements, and population growth stimulate regional development, they also give rise to critical concerns such as environmental degradation, traffic congestion, and social inequality. Addressing these challenges requires an integrated approach that links industry, academia, and government policies. As a science park operating within this evolving landscape, STeP functions as a catalyst for sustainable urban transformation.

One of STeP's core objectives is to strengthen university-industry linkage (UIL) by fostering collaboration between researchers, entrepreneurs, and corporations. Through UIL initiatives, academic expertise is applied to real-world challenges, leading to the development of new technologies and innovative solutions. STeP facilitates technology transfer programs that enable startups and established firms to access university research, laboratories, and expert consultation, accelerating the commercialization process.

Beyond traditional UIL mechanisms, STeP also promotes open innovation, encouraging partnerships among various stakeholders to co-create solutions for urban challenges. Through its incubation programs, co-working spaces, and startup accelerators, STeP cultivates an environment where knowledge exchange and cross-sector collaboration thrive.

The next section will explore how these efforts integrate into the broader NEC-Creative LANNA strategy, illustrating the ways in which STeP leverages its innovation-driven ecosystem to contribute to regional economic transformation and sustainable urban development.

III: NEC-CREATIVE LANNA AND REGIONAL DEVELOPMENT

The Northern Economic Corridor (NEC) strategically links regional development through its geographic advantages, enhancing economic potential across Northern Thailand. Each province contributes distinct strengths: Chiang Rai benefits from border trade with neighboring countries, Chiang Mai functions as the economic hub, Lamphun serves as an industrial center with export and electronics industries, and Lampang is a critical transportation hub connecting the central and northern regions. This network fosters economic activity and value-chain integration, enabling businesses to expand beyond traditional cultural industries.

The NEC-Creative LANNA framework focuses on four primary industries:

1. Creative Industry: Develop a digital media platform that leverages cultural capital, integrating digital media into creative industries for entrepreneurs. Foster networks, collaboration, and community engagement to drive innovation in creative endeavors.
2. Digital Industry: Develop digital products that align with key industry metrics and drive growth in target sectors. Promote the adoption of digital technologies among entrepreneurs to enhance competitiveness and innovation. Create high-value employment opportunities in the digital industry, contributing to sustainable economic and social development.
3. Tourism and Wellness Industry: Promote investments and collaborations among government, private sector, and local communities across wellness, culture, agriculture, food, and business tourism. Generate high-value employment opportunities and drive sustainable economic and social returns through effective tourism management strategies.
4. Agriculture and Food Industry: Develop digital platforms and sustainable agricultural infrastructure to support precision agriculture, food safety, and smart farming. Enhance industry efficiency while generating high-value employment and driving economic and social benefits. Establish certification systems to ensure quality and standards for agricultural and food products, while promoting circular utilization of agricultural materials for sustainability.

To implement this vision effectively, STeP actively engages regional stakeholders, ensuring that local needs shape development strategies. Focus groups conducted across Chiang Mai, Chiang Rai, Lamphun, and Lampang aim to identify barriers to entrepreneurship, innovation gaps, and sector-specific challenges. The objectives of these focus groups are identifying community-driven solutions for economic and technological development, strengthening the connection between local businesses and academic research, facilitating policy recommendations that align with industry needs.

To illustrate the projected impact of these strategies, several key metrics have been identified to evaluate progress and regional transformation. Regional development efforts under the NEC-Creative

LANNA strategy are expected to yield tangible economic and social outcomes. For instance, projections indicate that the Gross Provincial Product (GPP) in Northern Thailand is anticipated to increase from 500 billion to 1 trillion baht. Similarly, trade and investment activities are expected to double, showing a 100% increase. In terms of tourism, the region aims to attract 30 million visitors annually, up from 17 million, while the average happiness index of citizens is targeted to rise from 48.79 to 53. These quantitative indicators reinforce the value of integrated innovation models like STeP and underscore their capacity to drive economic prosperity and improve quality of life across the region.

Image 1 – NEC-Creative LANNA focus industries and target provinces.

The insights gathered from these discussions have led to targeted solutions, such as enhancing **access to university-led research**, attracting private sector investment, fostering entrepreneurship, and growing NEC target industries through strategic infrastructure improvements. Additionally, the integration of cultural heritage with technological advancement has been emphasized to create unique economic opportunities, such as developing digital platforms for local artisans, implementing smart tourism solutions, and promoting cultural innovation districts. Establishing the BCG Innovation Headquarters ensures that sustainable, innovation-driven economic models are prioritized within the region, with a strong emphasis on balancing traditional cultural assets with cutting-edge technology to foster a distinct and resilient regional identity.

IV: SMART CITY AND SUSTAINABLE SOLUTIONS

Beyond the previously mentioned projects, STeP has broadened its scope to develop smart city initiatives across multiple provinces, further cementing its role as a regional innovation leader. Smart city initiatives have become a cornerstone of urban development strategies, with STeP leading research, policy formulation, and practical implementation. These initiatives prioritize intelligent transportation systems, renewable energy integration, and the establishment of resilient digital infrastructure to enhance urban management. By incorporating cutting-edge technologies into urban planning, STeP improves operational efficiency, reduces environmental impact, and strengthens economic and social resilience. Empirical data from pilot programs highlight significant enhancements in public service delivery, transportation efficiency, and energy optimization, reinforcing the feasibility of replicating these solutions in other regions.

For example, **the MooVe project in Lampang** demonstrates STeP's role in advancing smart city solutions. Designed to improve urban mobility, the project utilizes a user-centered design approach, engaging commuters, policymakers, and transportation providers in a co-creation process. The initiative leverages big data analytics and IoT technologies to optimize public transport routes, reduce traffic

congestion, and enhance accessibility. Piloting and iterative testing ensure that the system meets real commuter needs before full-scale deployment. This project exemplifies how STeP integrates academic research with practical technological applications to create sustainable urban

V: FUTURE DIRECTIONS

Looking ahead, STeP aims to expand its impact by strengthening international partnerships, increasing funding opportunities for startups, and fostering cross-sector collaboration. Key long-term strategies include establishing Northern Thailand as a regional hub for sustainable innovation by enhancing collaboration between government, industry, and academia, promoting digital transformation, and leveraging local cultural assets to create an inclusive, knowledge-driven economy. Additionally, enhancing policy-driven support for science park development and smart city integration, along with promoting sustainable business models that align with NEC's economic objectives, will reinforce Chiang Mai's position as a leading innovation-driven city while ensuring that urbanization progresses sustainably and inclusively.

VI: KEY SUCCESS FACTORS

After a decade of operation, the pivotal success factors emerge as follows. Multi-stakeholder collaboration facilitates coordinated efforts between academia, government, industry, and local communities to create synergies that drive innovation, enhance economic growth, and ensure inclusive, broad-based benefits for sustainable development. Strategic Infrastructure Development, including the BCG Innovation Headquarters and startup incubators, serves as a key enabler of regional transformation. Technology transfer and commercialization bridge academic research with real-world applications, driving market-ready innovation. Community-driven development engages local entrepreneurs in co-creation to ensure that solutions are tailored to regional needs, while Smart City and sustainability focus integrates advanced urban technology solutions to enhance efficiency and livability. Lastly, long-term vision and policy alignment ensures coherence with national and regional policies, enabling sustained growth and investment.

VII: CONCLUSION

Science parks play a fundamental role in driving urban development, particularly in regions undergoing rapid transformation. STeP's initiatives in Chiang Mai exemplify how university science parks can integrate people, industry, and the city into a thriving innovation ecosystem. By aligning with NEC-Creative LANNA and fostering sustainable growth through smart city solutions, STeP contributes to economic resilience while enhancing the overall quality of life in Northern Thailand.