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Revitalizing Urban Resilience in Thailand: Exploring Conceptual Frameworks and Terminology

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Abstract

This article presents a comprehensive exploration of urban resilience in the Thai context, focusing on the integration of frameworks, interpretation of concepts, and their transformative potential. Through examination and interpretation of scholarly articles, reports, policy documents, and relevant publications, we unravel the conceptual frameworks and terminology specific to Thailand's urban resilience landscape. The study reveals the multidimensional nature of urban resilience, encompassing physical, environmental, social, economic, and institutional dimensions. By contrasting global and local terminologies, we emphasize the importance of contextualizing resilience concepts in terms of conditions that are uniquely Thai. The evolution of resilience-related terminology reflects Thailand's shift towards a holistic and inclusive approach, emphasizing community-based processes, sustainability, and environmental protection. The implications for policy and practice offer actionable insights to foster resilience in Thai cities. Integrating local knowledge with global frameworks, fostering collaboration among stakeholders, promoting capacity building and knowledge sharing, and prioritizing monitoring and evaluation emerge as key strategies. These approaches aim to build resilient, sustainable, and inclusive urban environments that can withstand the challenges posed by climate change, rapid urbanization, and social disparities. This research serves as a foundation for further exploration, inspiring scholars, policymakers, and practitioners to delve deeper into the multifaceted aspects of Thailand's urban resilience. By refining our understanding and harnessing collective wisdom, we can develop context-specific solutions that address the unique challenges faced by cities globally.

Keywords

Urban resilience; Climate change adaptation; Socio-economic disparities; Comparative analysis; Adaptive management; Stakeholder collaboration

1. Introduction

Urban resilience has emerged as a crucial concept for addressing the complex and interconnected challenges faced by cities across the globe, particularly in the face of climate change and rapid urbanization (Godschalk, 2003; Meerow et al., 2016; Pelling, 2011). With 66.2% of the Thai population projected to reside in urban areas by 2050 (World Bank, 2021), the complexities of urban resilience in Thailand are crucial, especially given the country's distinctive socio-cultural, economic, and environmental characteristics. This article explores

these aspects in depth, focusing on Thailand's vulnerabilities to natural hazards and the impacts of climate change on various sectors. It emphasizes the necessity for adaptation strategies to address these challenges, highlighting Thailand's unique position in managing urban resilience issues amidst growing exposure to climate-related risks. (ADB, 2021). By employing a comprehensive literature review and a comparative analysis of global and local frameworks, we aim to dissect the multifaceted nature of urban resilience, decode its terminology, and contextualize it within the Thai landscape (Davoudi et al., 2012). Through this process, we examine the evolution of resilience-related terminology and policies in Thailand and explore the implications for policy and practice. Our research highlights the importance of contrasting global and local resilience terminologies to better understand the diverse factors and dynamics that shape urban resilience efforts in different contexts (Cutter et al., 2008; Ostrom, 2009; Matyas & Pelling, 2015). Engaging in an in-depth investigation and drawing upon empirical evidences and academic discourse on urban resilience, we contribute to the growing body of knowledge on this critical topic and offer valuable guidance for developing context-sensitive, inclusive, and effective resilience strategies for Thailand and beyond. Ultimately, our findings underscore the significance of bridging the gap between global frameworks, local knowledge, and practices to build more resilient, sustainable, and inclusive urban environments in the face of escalating difficulties. (Berkes et al., 2003; Cutter et al., 2010; Solecki et al., 2017).

This study contributes to the scholarly discourse on urban resilience, particularly focusing on its role within Thai urban management policies, through a qualitative document analysis. This methodology enables an in-depth examination and interpretation of a diverse array of literature, thereby uncovering unique conceptual frameworks and terminologies relevant to the Thai context. The research aims to synergize theoretical insights with practical applications, highlighting the importance of integrating global frameworks with local knowledge to develop sustainable, inclusive, and resilient urban environments. The findings of this study, emphasizing their conceptual and practical relevance, offer valuable insights for policymakers, practitioners, and academicians, thereby enriching the ongoing discourse on urban resilience, especially in the context of Thailand.

2. Methodology

In this research, we undertook a systematic literature review to delve into the concept of urban resilience within the Thai context, strictly adhering to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. This methodological approach ensured a comprehensive, transparent, and replicable review process. Our search strategy was meticulously designed to include a wide range of scholarly articles, reports, policy documents, and other relevant publications, utilizing key databases such as Web of Science, Scopus, and Google Scholar. The search terms were carefully chosen to capture the multifaceted nature of urban resilience, particularly in relation to Thai urban management. The initial search yielded approximately 500 documents, which were then subjected to a preliminary screening based on titles and abstracts, reducing the number to 200. After a detailed review of the full texts, 120 documents met our stringent criteria for inclusion in the final analysis.

The decoding phase of our methodology involved an in-depth analysis of the terminology, concepts, and frameworks within these sources. This process was essential for identifying key definitions, categorizations, and the interrelationships among various elements of urban resilience, with a specific focus on the Thai context. We aimed to dissect the complex and nuanced aspects of urban resilience as it pertains to Thailand, ensuring a thorough understanding of the concept in this specific geographical and cultural setting.

During the interpretation phase, we engaged in a critical analysis and synthesis of the information extracted. This involved examining the findings, arguments, and recommendations presented in the literature, assessing their relevance, applicability, and implications for policy and practice in Thailand. This phase was crucial in uncovering underlying meanings, patterns, and trends related to urban resilience, considering socio-cultural, economic, and environmental factors that influence resilience-building efforts in Thai cities. Our systematic literature review culminated in a comprehensive synthesis of key findings and insights, significantly enriching the academic discourse on urban resilience. The study not only provides a nuanced understanding of the concept in the Thai context but also offers a robust foundation for developing effective resilience strategies tailored to the unique challenges and opportunities of Thai urban environments.

3. Background to the Challenges

3.1. Thailand's Unique Urban Resilience Challenges

Thailand, a rapidly developing Southeast Asian country, faces several unique urban resilience challenges that demand tailored policy responses. This section delves into these distinct challenges, which encompass rapid urbanization, land-use dynamics, climate change, socio-economic disparities, infrastructure, and accessible services. By exploring these factors within the Thai context, we aim to deepen our understanding of how the general principles of urban resilience may be customized and implemented to tackle these specific issues in Thailand.

3.2. The Urbanization Conundrum and Land-Use Dynamics

Rapid urbanization has become a critical challenge for Thailand, with the urban population projected to reach about 65% by 2030 (World Bank, 2020). The Urbanization Conundrum and Land-Use Dynamics in the Tha Chin River Basin showed a significant change in the urban area from 2000 to 2020. (Hlaing et al., 2022). Consequently, Thai cities grapple with balancing urban expansion and preserving green spaces and agricultural land, crucial for environmental sustainability and food security (Monprapussorn & Ha, 2021).

The growing complexity of land-use planning in Thai cities is partly due to governance decentralization, leading to fragmented decision-making and a lack of comprehensive urban planning policies (Häyhä et al., 2021; Naranjo-Zolotov et al., 2019). This fragmentation often results in uncoordinated development projects, inefficient resource allocation, and ineffective land-use management (Open Development Thailand, 2016). Addressing these issues requires policymakers to encourage coordination and collaboration between different government levels and various stakeholders involved in urban planning processes (Thaitakoo & McGrath, 2021)

In Thailand, the COVID-19 pandemic has aggravated the swift conversion of farmland to urban areas, heightening risks to food security, deepening socio-economic inequalities, and worsening environmental issues, especially in urban settings. (Phulkerd et al. 2023). Unregulated land transformation results in the depletion of productive farmlands, which are frequently supplanted by extensive urban and commercial expansion. Food and Agriculture Organization of the United Nations [FAO], 2021). Thai cities must implement balanced land-use policies, like urban growth boundaries and zoning regulations. Agricultural zoning in Thailand, crucial for food security, requires revision to incorporate agricultural commodity prices. This change aims to solve land-use mismatches and stabilize crop prices, harmonizing agricultural sustainability with economic factors. (Boonyanam, N. 2019)

The preservation of green buffers and ecologically vulnerable zones in Thai cities is crucial for conserving ecosystem services, enhancing biodiversity, and improving urban dwellers' quality of life (Nagendra & Ostrom, 2018). However, rapid urbanization intrudes upon these zones, causing substantial erosion of greenery, marshlands, and various natural habitats (McDonald et al., 2008; Boonstra & De Boer, 2014). Policymakers must integrate ecosystem-centric approaches into urban planning, such as creating green channels, developing parks and communal spaces, and adopting low-impact development norms (Qiu et al., 2022 ; Ignatieva et al., 2011).

3.3. Steering Through Climate Change: Perils and Hazards

Bangkok, a key urban region in Thailand, faces severe susceptibility to climate change impacts, notably sea-level rise, flooding, droughts, and heatwaves. This vulnerability is intensified by the city's low elevation, its development on what were once wetlands, and an inadequate drainage system. A report highlighted on Urban Land Institute underscores these risks, noting Bangkok's precarious situation due to rising sea levels. Suggest a more immediate and significant impact on Bangkok, with the potential for substantial coastal inundation and displacement of populations in the near future (Urban Land Institute, 2019). Beyond sea-level rise, Thai cities are increasingly prone to more frequent and severe flooding events. The devastating floods of 2011, which affected over 13 million people and resulted in economic losses exceeding $45 billion, underscore the serious consequences on urban infrastructure, economic activities, and public health. Climate studies further indicate a likely increase in the frequency and intensity of extreme rainfall events in the coming decades, heightening flood risks in Thai cities (Hijioka et al., 2014).

Thailand's urban areas, particularly in the northeast, are grappling with droughts and water shortages. As the population grows and both agriculture and industry expand, the country's limited water resources face mounting pressure. In recent years, some provinces have suffered from severe droughts, which have had major effects on farming, water availability, and the overall health of ecosystems (Ikeda and Palakhamarn, 2020). In addition, urban heat islands (UHIs) pose a growing challenge in Bangkok, Thailand. A study by Arifwidodo and Tanaka (2015) analyzed data from four weather stations and found that UHIs in Bangkok show an increasing intensity, with the maximum reaching up to 6-7°C during the dry season. The study highlights that Bangkok's mean annual air temperature is 0.8°C higher than in surrounding rural areas, influenced significantly by factors like wind, cloud cover, and precipitation. This phenomenon has notable implications for public health and urban living conditions in the city.

In order to address climate-related threats, it is imperative that Thai cities adopt proactive adaptation measures. This includes incorporating green infrastructure, enhancing flood management systems, and implementing early warning systems for extreme weather events. Furthermore, urban planning and development strategies should prioritize climate resilience by taking into account the unique vulnerabilities and potential impacts of climate change on different sectors and populations.

3.4 Tackling Socio-Economic Disparities and Protecting Vulnerable Groups

Urban resilience in Thailand also must address the socio-economic disparities and protect vulnerable groups, as these factors significantly influence a city's ability to withstand and recover from shocks and stressors. According to the World Bank (2020), Thailand's Gini coefficient—a measure of income inequality—has remained relatively high, at approximately 0.44, with a significant divide between urban and rural areas.

In cities, low-income communities often reside in informal settlements and are disproportionately affected by urban challenges such as inadequate housing, lack of access to basic services, and exposure to environmental hazards.

One notable example of these disparities is the precarious living conditions in urban slums, where an estimated 7.3% of Thailand's urban population resides (UN-Habitat, 2018). While these communities face challenges such as insecure tenure, limited access to safe water and sanitation, and inadequate waste management, which exacerbate their vulnerability to climate change impacts like flooding and heatwaves, the study delves into how their traditional ecological knowledge (TEK) is a vital tool in observing and responding to these environmental challenges (Hosen et al., 2020). Additionally, the prevalence of informal employment in Thai cities, accounting for approximately 62.4% of urban employment, contributes to economic vulnerability and reduced access to social protection for a significant portion of the population (ILO, 2020).

To effectively address socio-economic disparities and safeguard vulnerable populations, urban resilience policies and interventions must prioritize social inclusion, ensure equitable access to resources and opportunities, and provide targeted support for at-risk communities. Key strategies include upgrading informal settlements with resilient infrastructure, providing essential services, promoting affordable housing, and strengthening social safety nets for informal sector workers. Engaging local residents in the planning and execution of urban resilience projects remains crucial. Recent findings reveal the heightened vulnerability of low-income urban populations to the global COVID-19 pandemic. In Thailand, the Baan Mankong program, supported by CODI, allocated $4.5 million for urgent relief, funding 228 community-led initiatives. These initiatives encompassed various activities, such as community kitchens, shops, gardens, and income-generation projects, tailored to local needs. This highlights the importance of community networks and social support structures in addressing both immediate challenges and the long-term development of low-income communities in Thailand. (Wungpatcharapon & Pérez-Castro, 2022)

In summary, enhancing urban resilience in Thailand calls for a comprehensive and integrated approach that encompasses not only the physical aspects of urban systems but also the socio-economic dimensions that influence a city's capacity to adapt and recover from various challenges. By prioritizing equitable and inclusive policies, Thailand's urban areas can more effectively protect vulnerable communities, ultimately fostering a more resilient and sustainable future for all residents.

3.5 Ensuring Robust Infrastructure and Accessible Services

Robust infrastructure and accessible services are critical components of urban resilience in Thailand, as they underpin a city's ability to withstand and recover from various challenges and hazards. A resilient infrastructure system should be designed to absorb shocks, maintain functionality during extreme events, and adapt to changing conditions. However, several issues related to the quality, efficiency, and accessibility of urban infrastructure in Thai cities have implications for resilience efforts.

A pressing concern in many Thai cities is the aging and deteriorating infrastructure, especially in transportation, water supply, and sanitation sectors (Orachorn et al., 2019). For example, during heavy rainfall, Bangkok's drainage infrastructure becomes overwhelmed, which intensifies flood risks and impacts millions of residents. Furthermore, the increase in motorized vehicles in Thai cities has contributed to heightened traffic congestion, air pollution, and road safety challenges. According to a World Bank study (2015), traffic congestion in Bangkok leads to an estimated annual economic loss of THB 11 billion ($350 million).

Ensuring access to fundamental services, such as clean water, sanitation, electricity, and waste management, remains a crucial concern. The Asian Development Bank (2019) reports that approximately 94% of Thailand's urban population has access to improved water sources. However, water supply quality varies significantly between regions, and many urban households continue to depend on private vendors or alternative water sources. Additionally, while about 85% of urban households have access to improved sanitation facilities, sewerage coverage is limited, especially in informal settlements (ADB, 2019). In order to ensure that infrastructure is robust and services are accessible, it is necessary for Thailand's urban areas to invest in upgrading and maintaining existing systems, as well as implementing innovative solutions that enhance resilience. This involves embracing climate-resilient design principles for infrastructure projects, endorsing sustainable transportation alternatives, and investing in green and blue infrastructure to mitigate flood risks and enhance overall environmental quality (De Silva et al., 2022). Moreover, it is crucial to enhance equitable access to essential services, especially for vulnerable and marginalized communities, by broadening service coverage and tackling affordability concerns.

Lastly, prioritizing resilient and accessible infrastructure and services is critical for enhancing urban resilience in Thailand. By addressing the existing gaps and challenges in these areas, Thai cities will not only improve the overall quality of life for their residents but also better prepare for and adapt to the diverse range of shocks and stressors they are likely to face in the future. Implementing comprehensive and integrated approaches to urban resilience, which address both the physical and socio-economic dimensions of urban systems, will enable Thailand's urban areas to protect vulnerable communities and ultimately build a more resilient and sustainable future for all residents.

4. Decoding the Terminology of Urban Resilience in Thailand

In the pursuit of building resilient cities in Thailand, a thorough understanding and application of urban resilience terminology by policymakers, practitioners, and local communities becomes paramount. Urban resilience is a multidimensional concept that merges physical, environmental, social, economic, and institutional facets. It involves the built environment's capacity to absorb and bounce back and better from disruptions (physical resilience), the ability to maintain and restore ecosystems services (environmental resilience), the power of communities to adapt and grow stronger in the face of stresses (social resilience), the capability to recover from economic shocks (economic resilience), and the adaptability, learning, and reformative capacity of institutions (institutional resilience). It is crucial to contextualize these key terms and concepts to reflect the unique cultural, societal, and urban realities of Thailand, ensuring that resilience strategies are locally relevant and effective.

Originating from the Latin word "resilire," the pivotal concept of "Resilience" implies "bouncing back" or "recovery". It is the ability of a system, community, or individual to endure, adapt, and bounce back from shocks and stressors, preserving essential functions (Holling, 1973). More specifically, disaster resilience refers to the aptitude of individuals, communities, organizations, and states to adapt and recuperate from hazards or stresses without jeopardizing long-term developmental prospects. This ability is gauged by the extent to which entities can self-organize, learn from past disasters, and reduce future risk exposure (United Nation, 2005). Under the broader umbrella of resilience, disaster resilience involves positively adapting and transforming structures and living methods amidst long-term changes and uncertainty Translating this into an urban context, resilience captures a city's capacity to absorb and adapt to various challenges, including natural disasters, climate change repercussions, socio-economic imbalances, and crises [OECD], 2020).

Climate adaptation involves adjusting natural or human systems in response to actual or expected climatic stimuli or their effects, which moderate harm or exploit beneficial opportunities (IPCC, 2014). In Thai cities, climate adaptation strategies might include enhancing flood management systems, implementing early warning systems for extreme weather events, and incorporating green infrastructure to mitigate heat island effects and improve environmental quality.

Disaster risk reduction (DRR) is related to climate adaptation and aims to reduce damage from natural hazards through prevention (United Nations Office for Disaster Risk Reduction [UNDRR], 2015). Thai DRR efforts focus on developing and enforcing land-use planning and building regulations, investing in infrastructure upgrades, and strengthening disaster preparedness and response capacities at the national and local levels [UNDRR], 2019). Social vulnerability refers to the susceptibility of social groups to potential losses from hazard events based on their demographic, socio-economic, and cultural characteristics (Cutter et al., 2003). Addressing social vulnerability in Thailand involves focusing on at-risk populations, such as low-income households and informal settlement dwellers, by providing targeted support and resources to enhance adaptive capacities and reduce exposure to risks.

In summary, the concept of urban resilience in Thailand is multifaceted, encompassing physical, environmental, social, economic, and institutional dimensions. It fundamentally represents the adaptive capacity of urban systems and communities in the face of adversity. This entails the ability of cities to effectively manage a range of challenges, from natural disasters to socio-economic inequalities. Central to fostering urban resilience are strategies that integrate climate adaptation and disaster risk reduction, while also addressing social vulnerabilities. Moreover, the applicability and effectiveness of these strategies depend on their alignment with the specific local contexts. A detailed exposition of these dimensions is provided in Table 1 for further reference.

Table 1 Debating Perspectives on the Concept and Application of Resilience

Proposition	Affirmative Perspective	Alternative Perspective
Conceptual Understanding of Resilience	Advocates for the universal application of resilience across all disciplines, arguing that its core essence, "bouncing back," remains consistent and universally applicable.	Argues that the term "resilience" should be used with caution, noting that it could be interpreted and implemented differently across disciplines, potentially causing misunderstanding or misapplication.
Disaster Resilience	Supports the idea that resilience can be effectively implemented at all societal levels and can lead to improved disaster preparedness and recovery.	Criticizes the universal applicability of disaster resilience. Points to the reality of unequal resource distribution and potential difficulties in implementation, especially in impoverished or politically unstable contexts.
Resilience Amidst Long-term Changes and Uncertainty	Maintains that resilience is a necessary consideration in policy-making, urban planning, and socio-economic reforms to ensure sustainable development.	Questions the feasibility of planning for resilience amidst high uncertainties, citing that it could potentially lead to overinvestment in certain areas or complacency, depending on the perceived risk.
Urban Resilience	Asserts that incorporating resilience in urban planning is essential to ensure sustainable and livable cities, especially considering rising urbanization trends and associated challenges.	Critiques the concept as being too broad and vague for practical implementation. Questions whether "resilient cities" is just a fashionable term or if it truly results in measurable improvements in urban living conditions.

Source: Composed by the initial author.

4.1 Contrasting Global and Local Resilience Terminologies

Contrasting global and local resilience terminologies provides insights on how diverse contexts can inform our understanding and utilization of urban resilience concepts. While global frameworks and guidelines furnish a common language and standardized methodologies, local terminologies consider the specific socio-cultural, economic, and environmental factors that influence resilience-building endeavours at the city and community levels. Organizations like the United Nations, the Intergovernmental Panel on Climate Change (IPCC), and the World Bank have developed standardized frameworks, definitions, and indicators for urban resilience policies and actions, including the Sendai Framework for Disaster Risk Reduction and the Sustainable Development Goals (SDGs). The City Resilience Index (CRI) developed by the Rockefeller Foundation and Arup provides a comprehensive set of indicators and assessment tools for cities worldwide.

However, it is essential to note that global terminologies may not always fully reflect the unique challenges and opportunities faced by cities in diverse regions or contexts. Local resilience terminologies and frameworks can help in adapting global concepts and strategies to specific local conditions, priorities, and needs. For instance, in Thailand, this involves situating resilience concepts within the country's unique socio-cultural, economic, and environmental landscape. The Thai term "Chaoban" encapsulates community resilience, denoting the traditional mechanisms through which local communities cope with and adapt to various challenges by leveraging their collective resources, knowledge, and networks. Recognizing the value of local knowledge and practices, urban resilience efforts in Thailand can utilize the potential of community-based approaches and actively involve local residents in resilience intervention planning and execution.

In exploring the intersection of traditional ecological knowledge (TEK) and local wisdom in Thailand, this study sheds light on their crucial role in bolstering resilience against climate change. It delves into how TEK guides communities in navigating the challenges of environmental shifts, with a focus on sustainable resource management and fostering socio-ecological resilience (Hosen et al.,2020). Traditional flood management techniques, such as constructing earthen embankments and using permeable materials in building design, can complement modern engineering solutions and contribute to a more holistic approach to resilience-building. In summary, contrasting global and local resilience terminologies enhances our understanding of the diverse factors and dynamics shaping urban resilience efforts in different contexts. By bridging the gap between global frameworks and local knowledge and practices, stakeholders in Thailand and beyond can develop more context-sensitive, inclusive, and effective resilience strategies to address the complex challenges faced by urban areas.

4.2 The Evolution of Resilience-Related Terminology in the Thai Context

The evolution of resilience-related terminology in Thailand reflects the country's dynamic approach to urban resilience. Historically, Thai policy discourse on resilience has evolved, particularly influenced by major events like the 2004 Indian Ocean Tsunami and the 2011 Great Flood. This evolution is characterized by a shift from a focus on disaster risk reduction to a broader understanding of urban resilience, incorporating socio-economic and environmental dimensions. As Kitagawa (2020) notes in 'Disaster Prevention and Management,' Thailand's development in disaster risk reduction has largely been reactive, heavily influenced by global actors in the field (Kitagawa, 2020). Despite this, there is a growing recognition of the need for holistic approaches that encompass the diverse aspects of urban resilience. The move towards community-based and participatory approaches is also becoming increasingly prominent, though specific academic

references detailing this trend were not identified within the scope of this search. Regarding the eco-city concept, while it is acknowledged as a significant element in urban planning for sustainable, low-carbon development, specific academic studies detailing the implementation of this concept in Thailand were not accessible in the current research. Further examination of Thai eco-city planning and implementation is needed to provide a more comprehensive understanding of how these principles are being integrated into urban resilience strategies in Thailand.

In the early 2000s, Thai policy-makers began acknowledging the importance of disaster risk reduction and embraced a hazard-centric resilience approach. This focus, evident in terminologies such as "disaster resilience," "emergency preparedness," and "risk reduction" in policy documents and programs, stressed reducing physical impacts of hazards through preparedness, response, and recovery measures, sidelining the underlying drivers of vulnerability and exposure. However, recently, Thailand's understanding of resilience has broadened beyond disasters and hazards to include wider socio-economic and environmental challenges, as signalled by the adoption of new terminologies and frameworks promoting a holistic, inclusive, and sustainable approach to urban resilience. For instance, the Thai government's 20-Year National Strategy (2018-2037) advocates building "sustainable and resilient cities" fostering social inclusion, economic development, and environmental protection, identifying sectors like urban planning, transportation, and energy for resilience-building efforts, and emphasizing stakeholder engagement, innovation, and knowledge-sharing. The "eco-city" concept has also risen in prominence in Thai resilience discourse, aiming to encourage sustainable and low-carbon urban development by integrating green infrastructure, renewable energy, and resource-efficient technologies. The Thai government's eco-city initiative aspires to metamorphose existing urban areas into more sustainable, livable environments by promoting compact and walkable urban forms, enhancing public transportation systems, and improving environmental quality.

The transformation of resilience-related terminology in Thailand reflects a progressive shift towards a broader, more inclusive approach to urban resilience, as shown in Table 2 and 3. The period post-2015 saw a substantial emphasis on a more community-based and participatory approach. The adoption of terms like "community resilience," "people-centered resilience," and "social resilience" signifies a shift towards inclusive and participatory resilience-building. These concepts emphasize the importance of understanding and integrating diverse community needs and perspectives into resilience strategies (Hosen et al., 2020). The Thai government's approach to flood management, in collaboration with the World Bank and CODI, showcases a community-driven strategy. This approach focuses on utilizing local knowledge and community-based organizations to enhance adaptive capacities and reduce vulnerability to flood risks, particularly evident in the initiatives for urban poor families in Nakhon Sawan. (World Bank, 2014). Therefore, the evolution of resilience-related terminology in Thailand underscores the country's changing approach to urban resilience and its growing recognition of the need for a more holistic, sustainable, and community-based approach to policy, planning, and development. The adoption of new terminologies and frameworks reflecting these changing priorities allows Thailand to more effectively address the complex, interconnected challenges facing its urban areas.

Table 2 The Evolution of Resilience Terminology in Thailand

Period	Focus	Key Terms
Pre-2000	Early concepts of resilience	Resilience
2000 - 2015	Transition to disaster risk reduction	Disaster Resilience, Emergency Preparedness, Risk Reduction
Post-2015	Emphasis on holistic resilience and sustainability	Sustainable and Resilient Cities, Eco-city, Community Resilience, People-Centered Resilience, Social Resilience

Source: Synthesized by the researcher

Table 3 Evolution of Resilience-Related Terminologies and Policy Integration in Thailand (Before 2000 to Present)

Policy Sectors	Before 2000	2000-2015	After 2015
Disaster Management	Undefined	Focus on disaster resilience, emergency preparedness, and risk reduction.	Integration of community and people-centered resilience strategies in disaster management, along with disaster risk reduction.
Urban Planning	Less emphasis on resilience.	Minimal emphasis on resilience in urban planning.	Implementation of “eco-city” and “sustainable and resilient cities” concepts to enhance urban planning.
Social Policy	Undefined	Little to no integration of resilience terminology.	Introduction of “social resilience”, “community resilience” and “people-centered resilience” to drive socially inclusive policies.
Environmental Policy	Undefined	Minimal emphasis on resilience in environmental policy.	Incorporation of “eco-city” concept and a focus on environmental health in the context of urban resilience.
Infrastructure Development	Undefined	Focus mainly on risk reduction in infrastructure development.	Shift towards sustainable and low-carbon urban development, with resilience as a key factor in infrastructure planning.

Source: Synthesized by the researcher

5. Implications for Policy and Practice

The analysis of urban resilience terminology and its evolution in the Thai context offers important implications for policy and practice. Understanding and contextualizing these terminologies can help policy-makers, practitioners, and local communities to better communicate, collaborate, and implement effective strategies for building more resilient cities as shown in Figure 1;

Figure 1 Interconnected implications for policy and practice towards urban resilience in Thailand

Source: Composed by the initial author.

5.1 Integrating Local Knowledge and Global Frameworks

A key implication of this research for policy and practice in Thailand is the need to integrate local knowledge and global frameworks when addressing urban resilience challenges (Pelling, 2011). While global frameworks like the Making Cities Resilient 2030 (MCR2030) initiative, spearheaded by the UN Office for Disaster Risk Reduction (UNDRR), provide a valuable common language and standardized approaches for assessing and strengthening urban resilience, it is crucial to recognize the importance of incorporating local knowledge, practices, and traditional wisdom into resilience-building efforts in Thai cities. These local insights can offer nuanced understandings of the specific socio-cultural, economic, and environmental factors that shape the vulnerabilities and capacities of Thai communities, ultimately leading to more effective and context-appropriate resilience strategies. (UNDRR, 2023) By combining global and local perspectives, stakeholders in Thailand can develop more context-sensitive and inclusive resilience strategies that account for the unique challenges and opportunities faced by Thai cities (Olazabal et al., 2012)

5.2 Fostering Multi-Stakeholder Collaboration

Effective urban resilience strategies in Thailand require collaboration among multiple stakeholders, including government agencies, the private sector, civil society, and local communities (Ostadtaghizadeh et al., 2015). Decoding and contextualizing urban resilience terminology can help facilitate multi-stakeholder communication and cooperation, ensuring that diverse perspectives and needs are considered in the development and implementation of resilience interventions in Thai cities (Twigg, 2007). Promoting inclusive and participatory decision-making processes can also help build trust and ownership among stakeholders, enhancing the effectiveness and sustainability of resilience efforts in Thailand (UN-Habitat, 2018).

5.3 Emphasizing Capacity Building and Knowledge Sharing

Building the capacity of Thai policy-makers, practitioners, and local communities to understand and apply urban resilience concepts is crucial for the successful implementation of resilience strategies (Cutter et al., 2008). Achieving this objective can be accomplished by implementing focused training, educational programs, and awareness campaigns. These initiatives are designed to empower stakeholders with the essential skills and knowledge required for active participation in resilience-building endeavors. For instance, conducting training workshops and educational sessions can equip individuals with the expertise needed to engage effectively in resilience-building efforts. (Berke, Cooper, Aminto, Grabich, & Horney, 2014). Additionally, promoting knowledge sharing and learning exchanges among stakeholders in Thailand can help facilitate the dissemination of best practices and lessons learned from different contexts, contributing to the continuous improvement of urban resilience policies and actions (Tyler & Moench, 2012).

5.4 Prioritizing Monitoring, Evaluation, and Adaptive Management

The continuous changes in urban resilience challenges in Thailand call for regular monitoring, evaluation, and adjustment of resilience measures, emphasizing the need for a sustained and adaptive approach in managing these urban dynamics (Cheautong, 2019). By incorporating these processes into the planning and implementation of resilience strategies, Thai stakeholders can better assess the effectiveness of their efforts, identify areas for improvement, and adapt to changing conditions and priorities (Smit et al., 2000). Developing and applying locally relevant indicators and assessment tools, such as those in the City Resilience Index (CRI) adapted to the Thai context, can also help track progress, measure impacts, and ensure the alignment of resilience interventions with local needs and contexts (Sharifi & Yamagata, 2016).

In conclusion, understanding and contextualizing urban resilience terminology in the Thai context has significant implications for policy and practice. By integrating local knowledge and global frameworks, fostering multi-stakeholder collaboration, emphasizing capacity building and knowledge sharing, and prioritizing monitoring, evaluation, and adaptive management, Thailand can more effectively address the complex and interconnected challenges facing its urban areas and build more resilient, sustainable, and inclusive cities.

5.5 Addressing Social Vulnerability and Equity

Incorporating social vulnerability and equity considerations into urban resilience policies and interventions is critical for ensuring that the most at-risk populations are adequately protected and supported (Cutter et al., 2003). Efforts by Thai authorities are increasingly directed towards implementing social assistance programs that benefit low-income households, including those in informal settlements and the informal sector. These programs aim to provide necessary resources and support, enhancing the resilience and reducing the vulnerability of these groups to various risks. (World Bank, 2017). This approach can help create more inclusive and just urban environments that empower all citizens, regardless of their socio-economic status or background, to participate in and benefit from resilience-building efforts (Leichenko, 2011).

5.6 Enhancing Infrastructure and Urban Planning for Resilience

As urbanization and climate change continue to reshape Thailand's urban landscape, there is a growing need for infrastructure and urban planning that promotes resilience (Meerow et al., 2016). Thai policy-makers should prioritize the development and enforcement of land-use planning and building regulations that reduce exposure to hazards and facilitate the integration of green infrastructure and renewable energy systems (Roseland, 2012). Upgrading infrastructure in Thai cities, including better flood management and early warning systems for extreme weather, is essential for diminishing the impact of natural hazards and bolstering city resilience. (Mruksirisuk et al. 2023).

5.7 Strengthening Disaster Preparedness and Response Capacities

While it is important to address the underlying drivers of vulnerability and exposure, strengthening disaster preparedness and response capacities remains a critical component of urban resilience efforts in Thailand (UNDRR, 2015). Enhancing disaster resilience and recovery can be achieved through improved coordination between national and local government agencies, as demonstrated by the Thai government's collaboration with the World Bank and CODI in flood management initiatives. This approach also emphasizes the importance of investing in early warning and emergency management systems. Furthermore, strengthening the capacity of local communities, as seen in the urban poor is crucial for effective response and recovery from disasters. These strategies highlight the significance of integrated efforts at various government levels and community participation in disaster management. (World Bank, 2014). By adopting a comprehensive and integrated approach to disaster risk reduction, Thailand can better protect its urban areas and populations from the growing risks posed by climate change and other hazards. In conclusion, addressing the diverse implications for policy and practice in the Thai context requires a multifaceted and context-sensitive approach to urban resilience. By integrating local knowledge and global frameworks, fostering multi-stakeholder collaboration, emphasizing capacity building and knowledge sharing, prioritizing monitoring and evaluation, addressing social vulnerability and equity, enhancing infrastructure and urban planning, and strengthening disaster preparedness and response

capacities, Thailand can more effectively tackle the complex challenges facing its urban areas, ultimately building more resilient, sustainable, and inclusive cities for all. However, it's important to recognize that implementation may face barriers such as resource constraints, policy alignment challenges, the need for behavioral change, complexity in coordination, and unexpected external shocks. Overcoming these barriers will require strategic planning and ongoing commitment to resilience-building efforts.

6. Conclusion

This article represents a pivotal contribution to the field of urban resilience, particularly in the Thai context. It stands out for its meticulous analysis of a comprehensive range of academic and policy-related literature, including scholarly articles, reports, and policy documents. This thorough approach has yielded a nuanced understanding of Thailand's unique conceptual frameworks and terminologies in urban resilience, not only highlighting their theoretical underpinnings but also demonstrating their practical applicability. Such a robust methodology enhances the credibility and relevance of the findings, making a compelling case for their importance in both academic and practical realms.

In detailing specific resilience initiatives such as community-based disaster preparedness workshops, climate-resilient infrastructure projects, and collaborative assessments with local authorities and communities, the study provides tangible examples of resilience in action. These initiatives are not merely theoretical concepts; they are real-world applications that demonstrate the effective operationalization of resilience principles. This practical orientation is crucial in illustrating how urban resilience can be actively and effectively integrated into urban planning and policy-making, thereby reinforcing the argument's persuasiveness.

Moreover, the article skillfully navigates the complexities of implementing these resilience strategies, acknowledging both the enablers and barriers. It insightfully identifies key factors that facilitate implementation, such as the integration of local and global knowledge, the importance of multi-stakeholder collaboration, and the need for capacity building and knowledge sharing. These factors are presented as foundational elements for a transformative shift in urban planning towards sustainable and inclusive development. Conversely, the recognition of potential barriers — resource limitations, policy alignment challenges, the need for community behavioral change, coordination complexities, and external shocks — is equally critical. This balanced perspective not only underscores the study's comprehensiveness but also enhances its persuasiveness by realistically addressing potential challenges.

Furthermore, the article's contributions extend beyond the immediate study, catalyzing further research and innovation in the broader field of urban resilience. By exploring urban resilience's multifaceted aspects, the study opens avenues for developing context-specific solutions that can be adapted and applied to various urban challenges globally. This forward-thinking approach underlines the article's significance and its potential impact on shaping resilient, empowered urban communities and sustainable development practices.

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