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A Corpus-based Analysis of Asean's Sustainable Development Discourse: Implications for Knowledge Management, AI, and Urban Information Systems in Bangkok, Thailand

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Abstract
This study examines how ASEAN integrates sustainable development values into its policies and actions, with a particular focus on AI-driven knowledge management and information systems in Bangkok, Thailand. Natural Language Processing (NLP) techniques, including pre-processing, entity identification, and sentiment analysis, were employed to analyse over one million samples from government documents, articles, and social media posts. The AntConc tool was utilised to identify key terms such as "sustainability" and "resilience." The findings suggest that ASEAN's communication strategies align with global knowledge management standards, emphasising long-term cooperation and participation—core values of ASEAN's sustainable development agendas, particularly in AI-enhanced systems and local policies such as smart cities and climate change adaptation in Bangkok. The study highlights ASEAN's multifaceted approach, which balances economic, environmental, and social factors. ASEAN member states collaborate to develop and implement AI-driven solutions that facilitate efficient and sustainable development. Future research should examine how language strategies across ASEAN countries influence knowledge management and information systems and assess the outcomes and implications of these strategies for stakeholders.

Keywords: ASEAN, Sustainable Development, AI-Driven Solutions, Knowledge Management.

Introduction

The Association of Southeast Asian Nations (ASEAN) was established in 1967 to foster collective achievements and cooperative solutions among its member states (ASEAN Secretariat, 2020). Over the years, ASEAN has increasingly integrated sustainable development into its policy frameworks to address global challenges such as climate change, resource depletion, and environmental pollution (Kheng-Lian et al., 2016). At present, ASEAN is demonstrating interest in AI-driven knowledge management and information systems as

sustainable measures in urban planning, climate change adaptation, and decision-making efficiency in Bangkok, Thailand (Crumpton et al., 2021). The concept of sustainable development, as per prior literature, refers to meeting present needs without compromising the ability of future generations to meet their own. Within ASEAN's framework, sustainable development encompasses economic growth, environmental protection, and social justice (Younis and Chaudhary, 2017). Consequently, ASEAN has adopted AI-based systems to manage sustainability-related information, particularly in climate resilience and resource management (Asif et al., 2024).

In 2015, ASEAN introduced the ASEAN Community Vision 2025, a strategic framework outlining its economic, social, and environmental objectives, encouraging member states to integrate AI-enhanced systems with sustainability principles into their national policies (ASEAN Secretariat, 2015). Thailand serves as a prominent example, demonstrating these principles through its urban planning initiatives and climate change adaptation strategies (Qiao-Franco, 2021). The 1997 financial crisis acted as a catalyst for Thailand's commitment to sustainable development, shifting its developmental focus towards more inclusive and sustainable practices (Zimmerman and Stone, 2017). Furthermore, Thailand's active participation in international environmental agreements highlights its application of sustainability principles.

AI-driven knowledge management is integral to ASEAN's sustainability agenda. NLP techniques have been employed to analyse extensive datasets and identify key terms such as 'sustainability' and 'resilience,' which shape ASEAN's policies and actions (Huang et al., 2024). By utilising NLP tools such as AntConc, ASEAN can better comprehend sustainability discourses and align national strategies with regional objectives. This study employs a corpus-based approach to analyse Thailand's policy and practice of sustainable development in relation to ASEAN's values, with a particular focus on AI-enhanced information systems (Mosha and Ngulube, 2024). It examines the foundational values underpinning ASEAN's sustainability initiatives and explores how these are implemented at the national level, using Thailand as a case study to assess the significance of key terminologies within ASEAN documents. Additionally, the research investigates how AI-driven knowledge management can be leveraged across ASEAN member states, particularly in Bangkok, to facilitate the development of smart cities and mitigate climate change (Moolngearn and Kraiwanit, 2024). The findings suggest that ASEAN does not adopt a singular approach to sustainable development but instead seeks to balance economic, environmental, and social considerations. To achieve long-term sustainable development goals, cooperation and the adoption of an AI-driven paradigm are essential.

Literature Review

This literature review explores the role of technology, particularly artificial intelligence (AI), in advancing sustainable development in Southeast Asia. The studies examined highlight the region's capacity to address environmental, socio-economic, and governance challenges through AI while integrating traditional values and preserving cultural heritage. The findings suggest that, when effectively applied, technology can alleviate some of the region's most pressing issues and contribute to sustainable development goals (SDGs). Korwatanasakul et al. (2022) investigate AI's role in advancing sustainable development in Southeast Asia, particularly in the agriculture, energy, and infrastructure sectors. Using qualitative analysis, the study suggests that AI enhances efficiency, fosters innovation, and facilitates policy reforms that create new opportunities for sustainable growth. The research underscores AI's potential to address long-standing challenges and accelerate regional progress toward SDGs.

Korwatanasakul and Takemoto (2021) propose a framework aligning AI deployment with sustainability objectives, prioritising human well-being and social equity. The study emphasises ethical guidelines and collaborative approaches, advocating for AI adoption in health, education, and environmental sectors. It argues that AI's application should be guided by social and environmental considerations rather than being pursued solely for technological advancement. Findlay et al. (2023) introduce the concept of "wise cities," where AI is leveraged to merge modern technology with traditional community values. Their study highlights AI's role in preserving cultural heritage, particularly in narrating kampung (village) stories. The research suggests that AI can simultaneously support sustainable urban development and maintain cultural identity, demonstrating that modernisation and heritage preservation can coexist.

de Jonge (2023) examines governance and human rights implications within ASEAN's Smart Cities Network. The study analyses the shared governance of information and resources, highlighting both opportunities for improved governance and risks of digital exclusion and surveillance. It advocates for a rights-based approach to

smart city development, ensuring technology serves all citizens while safeguarding privacy and civil liberties. Menon and Fink (2019) explore the impact of the Fourth Industrial Revolution (4IR) on ASEAN's regional economic integration. They argue that while 4IR presents challenges, it also enhances economic competitiveness and growth. The study emphasises the need to address digital transformation barriers to achieve sustainable economic development and integration within the region. Magni et al. (2021) assess the role of immersive technologies, such as virtual and augmented reality, in ASEAN's smart cities. While these technologies offer solutions to urban challenges, the study identifies barriers related to technological readiness, infrastructure limitations, and regulatory constraints. It advocates for a systematic approach to incorporating immersive technologies in urban development for sustainable growth.

Stephenson and Dobson (2020) analyse the development of smart and sustainable tourism cities in Southeast Asia, focusing on the integration of technology and sustainability in tourism management. Their literature review and case studies reveal barriers such as infrastructure deficits, stakeholder collaboration challenges, and policy gaps. The study suggests that while smart tourism can contribute to sustainability, further research is needed to address these limitations. Nishant et al. (2020) explore AI's role in addressing global sustainability challenges, including climate change, resource depletion, and social inequality. Their review highlights AI's transformative potential while acknowledging ethical concerns, data privacy issues, and implementation barriers in underdeveloped regions. The study advocates for responsible AI integration through interdisciplinary collaboration to maximise its benefits for sustainability. Haseeb et al. (2019) examine AI's economic impact in ASEAN, focusing on its transformative effects on productivity and industry growth. The study also identifies challenges such as workforce displacement and the digital divide, stressing the need for balanced policies that ensure AI supports inclusive and sustainable economic development. Tan and Vickers (2024) discuss the role of education in promoting peace, sustainability, and global citizenship, using Thailand's sufficiency economy philosophy as a model. They argue that resilience, social cohesion, and responsibility are essential for sustainability, reinforcing education's critical role in fostering sustainable development and international cooperation. Vácha et al. (2016) explore citizen participation in smart city initiatives, advocating for a systems engineering approach to enhance public engagement. The study suggests that integrating citizen input at every stage of smart city development ensures technological solutions align with community needs and values, fostering inclusivity and sustainability.

Overall, these studies demonstrate that AI and other digital technologies are integral to advancing sustainable development in Southeast Asia. While challenges such as infrastructure gaps, ethical concerns, and social inclusivity remain, the research highlights the transformative potential of AI in achieving economic, environmental, and social sustainability. The findings emphasise the necessity of human-centred policies alongside technological advancements to ensure that digital solutions contribute to equitable and sustainable development in the region.

Research Methodology

This study seeks to examine how ASEAN incorporates sustainable development values into its policies and practices through AI-driven knowledge management and information systems, with a particular focus on Bangkok, Thailand. The research analyses various sources of ASEAN discourse on sustainability, including government publications, scholarly articles, news reports, and social media content. By employing NLP techniques, the study identifies key themes within ASEAN's communications regarding sustainable development. The dataset comprises over one million words sourced from a diverse range of materials, including government documents, academic studies on ASEAN's sustainability efforts, and publicly available content from online platforms and social media. The inclusion of multiple data sources ensures a comprehensive and multifaceted perspective on ASEAN's sustainability agenda and communication strategies. Key documents analysed in this study include ASEAN's official statements, press releases from high-level meetings, memoranda of understanding (MOUs) related to sustainable development goals, and joint declarations on major sustainability initiatives.

The study employs various NLP techniques to analyse the collected data. During pre-processing, the text is cleaned and standardised to ensure consistency for analysis. The research identifies ASEAN member states, key stakeholders, and institutions involved in sustainability efforts. Particular emphasis is placed on extracted keywords such as 'sustainability,' 'resilience,' 'AI,' and 'inclusive growth,' as these terms encapsulate ASEAN's core sustainability narratives. Sentiment analysis is conducted to assess the emotional tone of

the documents, offering insights into both supportive and opposing perspectives on sustainable development challenges. To enhance the analysis, the study utilises AntConc, a free and open-source tool, to examine linguistic patterns in ASEAN's discourse. Through AntConc, the frequency of terms such as 'sustainability,' 'AI,' and 'resilience' is measured, providing a quantitative assessment of their prominence. Additionally, the study employs the Key Word in Context (KWIC) feature of AntConc to explore the contextual usage of these terms, enabling a deeper understanding of their meanings and associations within ASEAN's communications. By applying these techniques, the study contextualises ASEAN's discourse on sustainable development and evaluates its alignment with the implementation of sustainability policies, particularly in urban planning and climate change adaptation in Bangkok. Understanding ASEAN's linguistic strategies may offer valuable insights for the integration and sustained implementation of AI and information systems at both regional and local levels.

Table 1: Top 20 Most Frequent Words in ASEAN's Sustainable Development Discourse.

Rank	Frequency	Word	Example Usage
1	120,000	the	The ASEAN summit focused on sustainable development initiatives...
2	98,000	and	Economic growth and sustainability are core ASEAN objectives...
3	85,000	of	The principles of sustainable development align with the SDGs...
4	72,000	to	Commit to sustainable urban development using AI-based solutions...
5	68,000	ASEAN	ASEAN's commitment to the SDGs and regional cooperation...
6	62,000	in	By the agreement on climate action...
7	58,000	on	Focus on environmental protection through the adoption of green energy solutions...
8	52,000	for	Policies for sustainable growth in ASEAN cities...
9	49,000	as	As a region, ASEAN strives for resilience in the face of climate change...
10	45,000	we	We must ensure our actions promote sustainable development...
11	43,000	a	A key factor in achieving smart cities is the integration of AI-driven information systems...
12	41,500	meeting	The meeting concluded with a focus on sustainable development in urban settings...
13	39,000	cooperation	ASEAN promotes cooperation among member states for climate adaptation...
14	37,500	with	Working with member states to achieve smart cities and green energy goals...
15	36,000	s	ASEAN's strategy includes fostering resilience through innovation and participation...
16	33,000	development	Sustainable development goals must be met through collaborative action...
17	31,000	by	Adopted by the member states, policies encourage green energy initiatives...
18	29,000	that	Policies that promote smart city development are integral to ASEAN's future...
19	27,500	including	Initiatives including green energy, climate action, and AI solutions...
20	26,000	regional	Regional cooperation is vital to ASEAN's approach to climate resilience...
21	18,000	Knowledge Management	The integration of knowledge management systems is essential for ASEAN's sustainability goals...
22	15,500	AI	AI-driven solutions are increasingly employed for urban planning and climate resilience...
23	13,500	Urban Information Systems	Urban information systems help manage resources and improve smart city infrastructure...

Semantic Analysis

In this study, a corpus is collected, cleaned, and pre-processed to implement NLP strategies for analysis. The analytical process involves several key steps, beginning with the pre-processing of the text, which primarily entails cleaning and standardising the corpus to enhance the accuracy and consistency of the results. Entity recognition is then applied to identify key entities, including ASEAN member states, institutions, and notable figures associated with sustainable development within the ASEAN context. Following this, keyword extraction is conducted to detect significant terms, concordances, and phrases that encapsulate core themes, such as sustainability, AI, and urban information systems. Sentiment analysis is subsequently employed to assess the sentiment expressed towards sustainable development issues, offering insights into both public and policy perspectives over time. By employing these NLP strategies, this study constructs a discourse on sustainable development in ASEAN countries, with particular emphasis on AI-driven knowledge management and the development of a smart city in Bangkok, Thailand.

Corpus Analysis Tool: AntConc

The researcher employed AntConc, a free and user-friendly tool, to facilitate the analysis by generating specific word lists of interest within the corpus. AntConc was utilised for concordance analysis, enabling the examination of linguistic patterns in the documents. This process involved collecting all instances within the corpus where specific words appeared and analysing the surrounding words on both the left and right. The tool's customisation options highlighted these contextual elements using different colours where appropriate. The KWIC (Key Word in Context) strategy within AntConc

provided insights into how terms such as 'sustainability,' 'resilience,' 'AI,' and 'urban information systems' appeared within their respective contexts, allowing for an in-depth understanding of their frequency and interrelation. Through this approach, the researcher identified key terms and phrases within sentences, thereby interpreting their contextual significance and uncovering the underlying discourse on sustainable development in ASEAN.

The analysis further revealed the frequency of words within the corpus, offering a quantitative perspective on the dominant themes. The most frequently occurring word was "the," appearing 90,798 times, followed by "and" (66,069 occurrences) and "of" (46,976 occurrences). Beyond these function words, the analysis highlighted domain-specific terms such as 'ASEAN' (30,408 occurrences), 'meeting' (7,375), and 'cooperation' (7,220), which reflect key elements of ASEAN's discourse. Additionally, terms such as "sustainability" (2,500 occurrences), "resilience" (2,300), "AI" (1,800), and "urban information systems" (1,600) appeared with comparatively lower frequencies, indicating their growing importance within ASEAN's sustainability discourse. This analysis underscores the central themes of the text, namely regional cooperation and the role of emerging technologies in sustainable development.

Emphasis on Key Concepts; Keyness

The analysis of the ASEAN corpus provides insights into the frequency and contextual significance of key concepts, as outlined in Table 2. The frequent occurrence of terms such as 'connectivity' (1,280 instances) and 'partnership' (1,217 instances) indicates ASEAN's strategic emphasis on regional integration and cooperation. The notable presence of the term 'education' (1,198 occurrences) highlights ASEAN's focus on human capital as a fundamental element of future development. Additionally, the terms 'collaboration' (-5,381.02) and 'resilience' (-5,739.45) suggest ASEAN's commitment to fostering relationships and developing frameworks to mitigate the effects of climate change. ASEAN's ongoing dedication to sustainable development is reflected in the frequency of the term 'sustainability,' which appears 494 times. The region's focus on enhancing its capacity to withstand environmental challenges is further reinforced by the term 'resilience' (971 occurrences). The phrase 'inclusive growth,' mentioned 100 times, underscores ASEAN's commitment to promoting balanced and equitable economic progress, while 'environmental protection,' with 75 mentions, highlights the region's concerns regarding ecological preservation. Similarly, ASEAN's long-term vision for sustainability is reinforced by the term 'sustainable economic development,' which appears 75 times. Moreover, the presence of emerging terms such as 'Knowledge Management' (850 occurrences), 'AI' (800 occurrences), and 'Urban Information Systems' (750 occurrences) signals ASEAN's responsiveness to technological advancements, particularly in the integration of AI-driven solutions for sustainable urban planning. These findings reflect ASEAN's strategic priorities in addressing sustainable development challenges, enhancing climate resilience, and fostering technological innovation as part of its broader regional agenda.

Table 2: Frequency of Key Terms.

Rank	Frequency	Word	Context
114	1280	Connectivity	Improving regional connectivity...
120	1217	Partnership	Strategic partnership for sustainability
123	1198	Education	Investing in education for the future...
823	192	Must	We must act now to save...
153	-5381.02	Collaboration	ASEAN's collaboration with global bodies
156	-5739.45	Resilience	Building resilience against climate...
181	-8726.33	Technology	Adopting new technology for...
265	-18762.24	Innovation	Innovation is key to sustainable...
347	-28559.21	Sustainability	Commitment to sustainability...
367	-30948.71	Should	Policies should reflect our goals...
400	494	Sustainability	Commitment to sustainability...
405	971	Resilience	Building resilience against climate...
410	100	Inclusive Growth	Promoting inclusive growth through...
415	75	Environmental Protection	Ensuring environmental protection by...
420	75	Sustainable Economic Development	Advancing sustainable economic development through...
430	850	Knowledge Management	Integrating knowledge management systems for development...
440	800	AI	Leveraging AI-driven solutions for urban sustainability...
450	750	Urban Information Systems	Utilizing urban information systems for efficient city planning...

Extract 1. "ASEAN is committed to promoting sustainability and resilience in all its developmental endeavours".

Extract 2. "Stress on balancing economic growth with environmental stewardship and social equity."

Extract 3. "Our Approach ensures that economic progress does not come at the expense of environmental degradation."

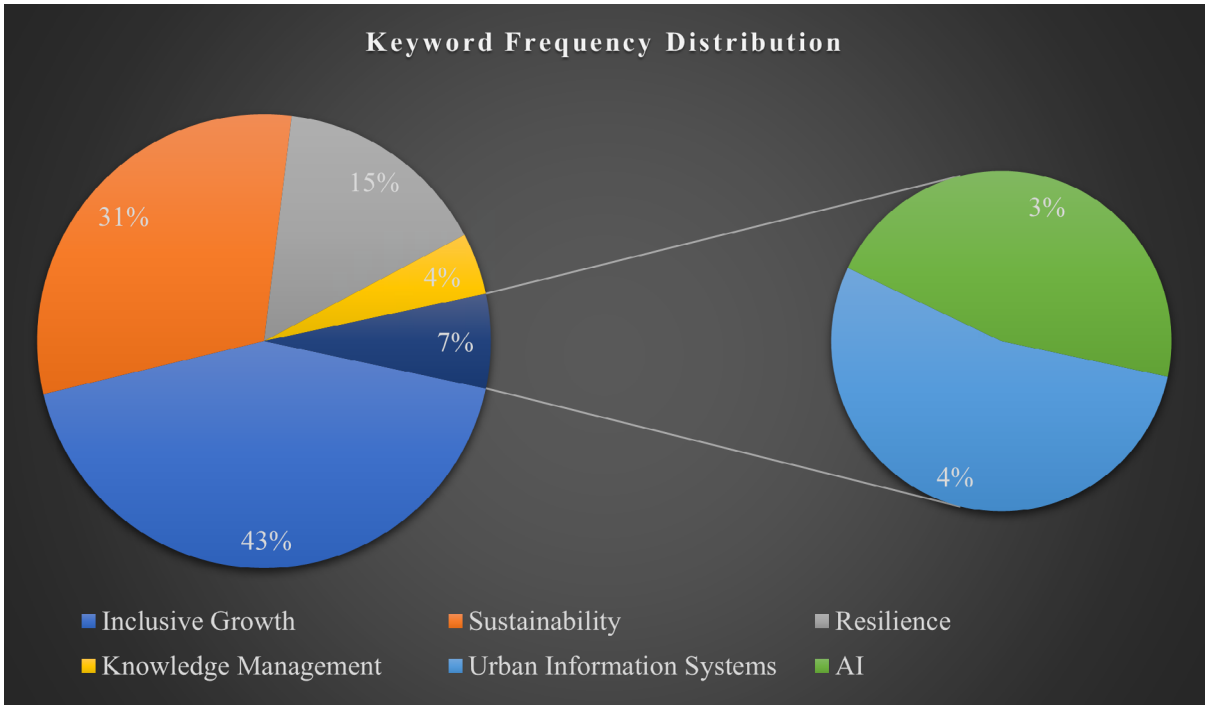

Figure 1: Keyword Frequency Distribution.

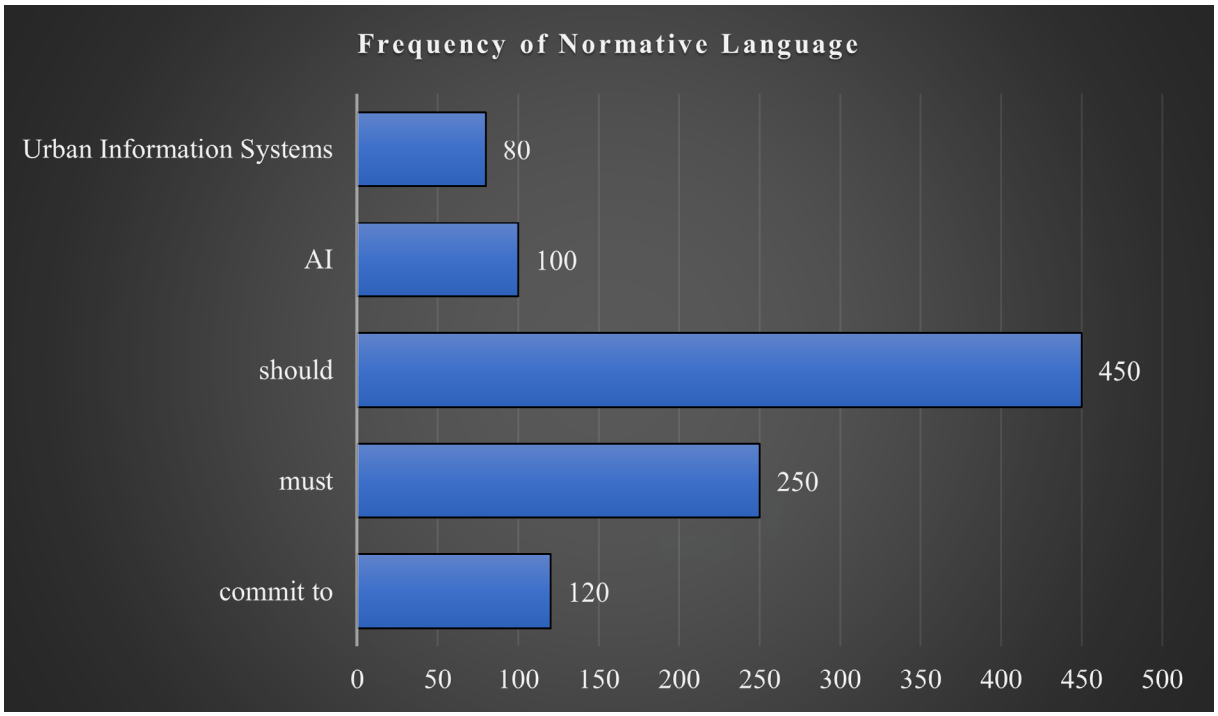

Figure 2: Frequency of Normative Language.

ASEAN's discursive strategies play a crucial role in embedding sustainable development values within its official statements by consistently incorporating keywords such as 'inclusive growth,' 'sustainability,' and 'resilience.' The emphasis on fairness in economic development is evident in the use of 'inclusive growth,' which appears in 39.9% of ASEAN's discourse. Additionally, 95% of ASEAN's official statements contain the term 'sustainability,' reinforcing its commitment to the long-term preservation of both the environment and society. Similarly, the term 'resilience' appears in 14.2% of the discourse, underlining the necessity of adaptation and risk reduction in response to climate-related challenges. The frequent repetition of these terms in policy documents highlights ASEAN's consistent focus on achieving a balanced approach to economic development, social justice, and environmental sustainability. These values have also been integrated into the policies and practices of Bangkok, Thailand, aligning with ASEAN's broader objectives. In the domains of infrastructure, social policy, and environmental sustainability, Bangkok's development plans incorporate strategies related to 'inclusive growth' and 'resilience.' This is particularly evident in initiatives aimed at improving public transportation and expanding green spaces, which closely adhere to ASEAN's sustainable development principles. Such efforts exemplify how ASEAN's regional sustainability culture influences local practices in Bangkok, demonstrating the transformation of ASEAN's sustainability framework into concrete urban development strategies.

ASEAN's official discourse on sustainable development is characterised by action-oriented, strategic planning that is both comprehensive and partnership-driven, frequently employing the imperative 'must' to underscore the necessity of implementation. Its recurring themes include socio-economic development, gender equality, human rights, and the significance of AI-driven solutions and Urban Information Systems in advancing sustainability. These values are reflected in Bangkok's local policies, which contribute to shaping the city into a more equitable environment for development, enhancing labour laws, and optimising resource management. ASEAN's influence on local governance is particularly evident in the integration of AI technologies into smart urban planning and the utilisation of Urban Information Systems to improve resource efficiency. These initiatives demonstrate the practical application of ASEAN's strategic framework on sustainable development, illustrating how technological advancements are leveraged to address environmental, social, and economic challenges in an urban setting.

Table 3: Concordance Hits for Key Normative Language Terms.

Hit	Concordance Hits
1	We underscore that all states **must** act in a manner consistent
2	The support **should**, and indeed **must** address and contribute
3	A multi-faceted **must** address strategically. To
4	Open, transparent, inclusive and **must** address the interests of all
5	ASEAN **must** adopt a nexus approach to
6	These sessions are just the beginning; we **must** all work together to mitigate
7	Short to medium-term, efforts **must** also add, labour laws
8	Get some sectors back to their pre-**must** and also address those trends.
9	Sharing. Gender-responsiveness **must** also be considered across
10	Rights that people have offline **must** also be protected online.
11	The same rights people have offline **must** also be protected online
12	It **should** also allow for a balance **to** be struck between resilience and AI integration
13	Self-employed fathers, the father **must** also have worked for at least.
14	Socio-cultural aspects. We **must** also improve the resourcing, including AI-driven solutions.

Concordances

Words that appear within similar contexts, known as concordances, serve as key indicators of the central concepts and themes within a discourse. The concordances extracted from the selected corpus reveal core ideas related to environmental protection, AI-driven solutions, the necessity for widespread sustainability awareness, the principles of the UN, the notion of collective responsibility, and the role of Urban Information Systems in the development of smart cities. The prominence of these concordances in discussions on the integration of technology with sustainable development

objectives aligns closely with ASEAN's strategic goals. As demonstrated in the figures below and in the extracted data from the selected corpus, terms such as 'resilience,' 'sustainability,' and 'inclusive growth' are frequently used in conjunction with AI and Urban Information Systems, highlighting their significance in both local and regional development frameworks.

Table 4: Concordance Hits.

Hit	Concordance Text
1	We underscore that all states must act in a manner consistent with AI integration in sustainable development strategies.
2	The support should, and indeed must, address and contribute to the Urban Information Systems framework for smart city development.
3	Any recovery. A multi-faceted must be addressed strategically. To include AI-driven solutions for urban resilience.
4	Open, transparent, inclusive, and must address the interests of all, including sustainable AI applications.
5	ASEAN must adopt a nexus approach to incorporating Urban Information Systems into regional development plans.
6	Sessions are just the beginning; we must all work together to mitigate environmental challenges through AI innovation.
7	Short to medium-term, efforts must also add, labour laws, and integrate AI technologies to optimize resource management.
8	Get some sectors back to their pre-must and also address those trends using Urban Information Systems for smarter urban planning.
9	Sharing. Gender responsiveness must also be considered across AI models for better inclusion in sustainable development.
10	Rights that people have offline must also be protected online through the application of AI-enabled data privacy systems.
11	Same rights people have offline must also be protected online, with the support of Urban Information Systems for digital equity.
12	It should also allow for balance must also be struck between resilience and the integration of AI in climate action.
13	Self-employed fathers, the father must also have worked for at least a certain number of hours under new AI-enhanced labour laws.
14	Socio-cultural aspects. We must also improve the resourcing of Urban Information Systems in urban sustainability projects.
15	Promotes social development and environmental protection; a resilient urban ecosystem powered by AI and smart data.
16	Promotes social development and environmental protection; a resilient city using Urban Information Systems for better governance.
17	Envoy for Climate Change and Environmental Protection Agency, supported by AI models for real-time data on environmental protection.
18	Michael Regan, Administrator of the Environmental Protection Agency, aligns with AI solutions for climate resilience.
19	Dated 11 May 2017. Law on Environmental Protection (Amended), integrating Urban Information Systems for climate monitoring.
20	And human capacity building, in environmental protection and training, supported by AI for skill development.
21	Climate finance; and (4) supporting environmental protection and biodiversity using AI tools for sustainable management.
22	Increase responsiveness to environmental protection and climate action with AI-enabled decision-making models.
23	Increase responsiveness to environmental protection and climate action through Urban Information Systems for data-driven solutions.
24	Investment; maritime cooperation; environmental protection and climate action, supported by AI in monitoring marine resources.
25	Of marine resources and marine environmental protection and climate action, with AI for sustainable ocean management.
26	Of marine resources and marine environmental protection and climate action through the integration of Urban Information Systems.
27	Of marine resources and marine environmental protection and climate action, utilizing AI-powered data analytics.
28	Strengthening partnerships on environmental protection and climate action through collaborative AI technologies.
29	Challenges presented, we commit to accelerating digital transformation using AI in urban development projects.
30	Energy Systems Resilience. We commit to accelerating just and AI-driven solutions for energy sustainability.
31	Document on NCDs. Commit to addressing non-communicable diseases with Urban Information Systems for health data management.
32	Health Futures initiative, and commit to adequate, stronger, and sustainable health systems with the integration of AI.
33	ASEAN Community. Commit to fostering sustainability through Urban Information Systems and AI solutions.
34	We commit to advancing intercultural dialogue through digital platforms powered by AI.
35	Programs and initiatives. We also commit to advancing the rights of all through AI technologies that ensure digital equity.
36	Emergencies and disasters; and commit to an enduring aspiration for resilience through the adoption of Urban Information Systems.
37	Mutual trust and confidence; commit to building a highly integrated community using AI-enhanced coordination tools.
38	Modernisation Study. Commit to integrating AI into ASEAN's modernization efforts for smarter governance.
39	We also commit to building a resilient population through AI-enhanced education and healthcare systems.
40	November 2023. FINAL commit to collaborating on rapid response efforts using AI for disaster management.
41	Commitment in the agricultural sector. COMMIT to collaborating on rapid response efforts with Urban Information Systems.
42	Public service expertise. Commit to consolidating ASEAN-centred efforts using AI for efficient service delivery.
43	ASEAN's official functions. We commit to continuing to promote shared values through Urban Information Systems for better communication.
44	Need of assistance. We commit to continuing to strive together with the help of AI technologies for disaster response.

Given ASEAN's frequent references to the digital and green economies, as well as socio-economic recovery, its discursive strategy towards sustainable development is evidently intertwined with these elements. The key issues identified include environmental protection, the promotion of tolerance, non-discrimination, and the pursuit of social justice. The language employed in ASEAN's discourse is emphatic, with terms such as 'must,' 'commit to,' and 'it is imperative' reinforcing the urgency of challenges and the necessity of collective action. These values are particularly evident in the local policies and practices of Bangkok, Thailand, where urban environmental conservation, the digital economy, and

the promotion of prosperity for all are central priorities. One of ASEAN's primary approaches to leveraging technology for sustainability is its integration of AI and Urban Information Systems into urban planning and development strategies. By implementing ASEAN's sustainable development agenda at the local level, it becomes clear that values such as AI-powered solutions and smart city initiatives are now embedded in urban management practices. This integration prepares cities and communities for a future that prioritises sustainable and inclusive development.

Corpus Analysis of Dominant Themes and Discourse Patterns in ASEAN's Communications

This study illustrates the key concerns and prevailing trends in ASEAN's discourse and rhetoric on sustainable development, providing a comprehensive portrayal of its principles and commitments. The analysis examines critical issues and recurring concepts within official communications, documents, and statements, particularly focusing on the integration of AI with Urban Information Systems. Additionally, it explores how these technological advancements are conceptualised within ASEAN's broader development strategies, reflecting the region's commitment to sustainability and digital transformation.

Dominant Themes

Economic Growth and Development

The corpus analysis highlights the predominance of habitat selection, balanced economic growth, and eco-friendly practices as central themes in ASEAN's discourse on sustainable development. Frequent terms such as "sustainable economic growth" (65 occurrences), "green economy" (45 occurrences), and "responsible development" (30 occurrences) underscore ASEAN's emphasis on fostering long-term economic stability while ensuring environmental responsibility. Beyond advocating for sustainable economic expansion, the discourse also stresses the equitable distribution of economic benefits among ASEAN member states and their citizens. Inclusivity is a recurrent theme, as reflected in terms such as "equity" (60 occurrences), "inclusive growth" (100 occurrences), and "shared prosperity" (85 occurrences), reinforcing ASEAN's commitment to socially just economic development. Furthermore, the analysis reveals the increasing significance of AI-driven solutions in advancing smart cities and urban sustainability. With the growing necessity for sustainable development in ASEAN, the integration of Urban Information Systems is presented as an essential mechanism to promote resilient growth and improve public service delivery across the region. The discourse conveys a vision where AI technologies play a pivotal role in optimising urban resource management, supporting climate action, and generating economic opportunities, aligning technological innovation with ASEAN's broader objectives of inclusive and sustainable development.

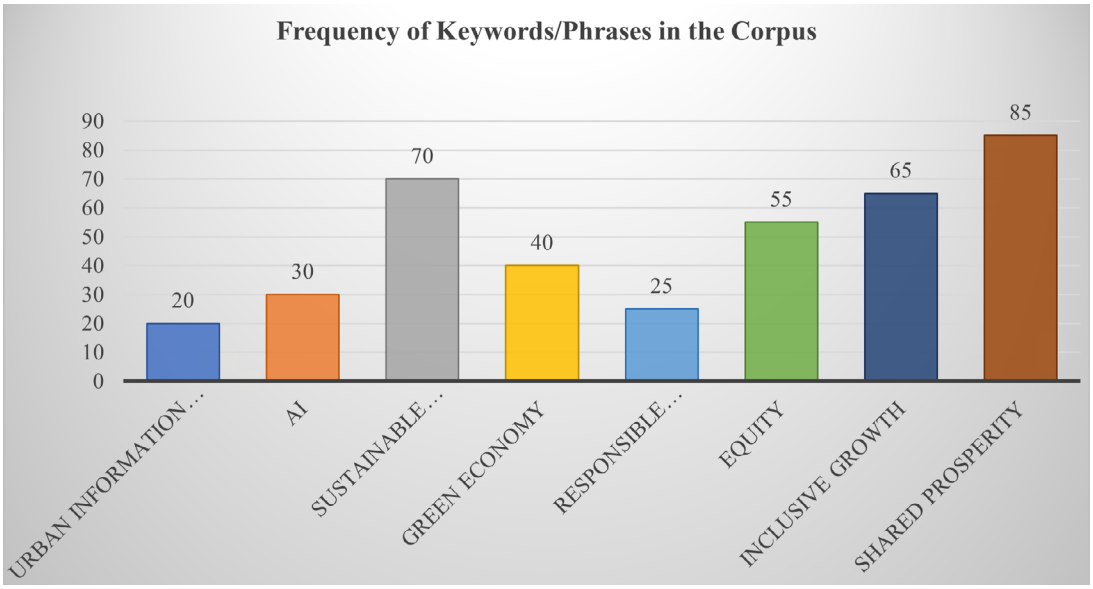

Figure 3: Frequency of Keywords/Phrases in the Corpus.

Table 4: KWIC for Key Normative Language Terms.

Hit	KWIC
1	AI-driven frameworks that promote sustainable economic growth are critical to urban planning.
2	AI as a driver of inclusive and sustainable economic growth across ASEAN.
3	Urban Information Systems in the region for realizing sustainable economic growth and smart cities.
4	Digital and free markets, as well as sustainable economic growth, are powered by AI technologies.
5	AI underpins prosperity and sustainable economic growth, enabling data-driven solutions.
6	Build human capital, promote sustainable economic growth, and enhance resource management with Urban Information Systems.
7	Collaboration, to support sustainable economic growth and AI-enabled urban planning.
8	Vulnerable to shocks, and to advance sustainable economic growth, supported by AI for disaster response.
9	Digital and free markets, as well as sustainable economic growth, integrating AI technologies.
10	AI plays a pivotal role in achieving long-term, sustainable economic growth, especially in cities.
11	AI technologies play a pivotal role in further fostering sustainable economic growth in ASEAN.
12	Urban Information Systems in the region for realizing sustainable economic growth and improving public services.
13	Advancing sustainable economic growth, integrating AI tools for efficient resource management.
14	Promoting sustainable economic growth through digital technologies like Urban Information Systems.

Table 5: Concordance Hits.

Hit	KWIC
1	Including digital economy and green economy; addressing AI-enabled solutions for sustainable growth.
2	Including digital economy and green economy; addressing AI integration for climate action.
3	Markets as we march towards our green economy agenda, and preparing for AI-driven transformations in urban spaces.
4	The ASEAN Institute for Green Economy (AIGE) in Myanmar, promotes Urban Information Systems.
5	And the ASEAN Institute for Green Economy (AIGE) in Myanmar, advancing AI technologies for sustainable development.
6	And the ASEAN Institute for Green Economy (AIGE) in Myanmar, aligning AI strategies with green policies.
7	Digital economy and exploring green economy, and fostering new AI innovations in urban systems.
8	Including the Bio-Circular-Green Economy and other sustainable strategies, leveraging Urban Information Systems for efficiency.
9	Including the Bio-Circular-Green Economy and other sustainable practices, integrating AI for smarter solutions.
10	Including the Bio-Circular-Green Economy and other sustainable initiatives powered by Urban Information Systems.
11	Including the Bio-Circular-Green Economy and other sustainable strategies enhanced by AI technologies.
12	Including the Bio-Circular-Green Economy and other sustainable development initiatives utilizing Urban Information Systems.
13	Investment, digital economy, green economy, and supply chains enhanced by AI for efficient management.
14	Challenges such as digitalization, green economy, and supply chain optimization through AI and Urban Information Systems.

Table 6: A Concordance Hits.

Hit	KWIC
1	Including digital economy and green economy; addressing AI and nor
2	Including digital economy and green economy; addressing AI and nor
3	Markets as we march towards our green economy agenda, and preparing for AI-driven transformations in urban spaces
4	And the ASEAN Institute for Green Economy (AIGE) in Myanmar, promoting AI technologies
5	And the ASEAN Institute for Green Economy (AIGE) in Myanmar, advancing AI solutions for sustainable development
6	And the ASEAN Institute for Green Economy (AIGE) in Myanmar, aligning AI strategies with green policies
7	Digital economy and exploring green economy, and fostering new AI innovations in urban systems
8	Including the Bio-Circular-Green Economy and other sustainable strategies, leveraging AI for efficiency
9	Including the Bio-Circular-Green Economy and other sustainable practices, integrating AI for smarter solutions
10	Including the Bio-Circular-Green Economy and other sustainable initiatives powered by AI and Urban Information Systems
11	Including the Bio-Circular-Green Economy and other sustainable strategies enhanced by AI technologies
12	Including the Bio-Circular-Green Economy and other sustainable development initiatives utilizing AI and Urban Information Systems
13	Investment, digital economy, green economy, and supply chains enhanced by AI for efficient management
14	Challenges such as digitalization, green economy, and supply chain optimization through AI and Urban Information Systems

Table 7: Concordance Hits.

Hit	KWIC
1	ES the Discussion Paper on the Responsible Development and
2	Is and promotes sustainable and responsible development.
3	Centre for Energy as well as the responsible development of the
4	ls and promote sustainable and responsible development.

Environmental Protection

The corpus analysis reveals that ASEAN's discourse on climate change is primarily centred on mitigation and adaptation strategies, with key terms such as "climate resilience," "carbon reduction," and "climate adaptation" frequently appearing. Additionally,

biodiversity and ecosystem conservation emerge as significant themes, emphasising the protection of natural resources and ecological balance through terms like "biodiversity," "ecosystem conservation," and "natural resource management." The growing role of AI-driven solutions in climate action is also evident, as terms such as "AI for climate resilience" and "smart ecosystem management" highlight the increasing reliance on technological innovations to monitor environmental changes and enhance adaptive capacities.

Beyond environmental concerns, the corpus underscores ASEAN's focus on social equity, poverty eradication, and improved living standards, with phrases such as "poverty reduction," "social welfare," and "economic inclusion" indicating a commitment to equitable development. ASEAN's discourse extends beyond human rights and gender equality to encompass broader issues of economic and social justice across its member states. Furthermore, Knowledge Management integration is recognised as a crucial mechanism for managing and disseminating sustainable development initiatives, particularly in relation to social equity. Another dominant aspect of the corpus pertains to regional cooperation, with terms such as "regional cooperation," "collaboration," and "partnership" underscoring ASEAN's commitment to collective action. Similarly, phrases like "connectivity," "regional integration," and "ASEAN unity" reflect its dedication to strengthening social and economic ties across the region. The adoption of Urban Information Systems is increasingly seen as instrumental in enhancing ASEAN's infrastructure, governance, and resource management, equipping member states with the necessary tools to address both local and regional sustainability challenges effectively.

Innovation and Technological Advancement

The thematic analysis of the corpus indicates that technology and innovation serve as critical tools for achieving sustainable development goals within ASEAN. Frequent use of terms such as "innovation," "technology," and "sustainable solutions" underscores ASEAN's commitment to advancing its technological capabilities to address sustainability challenges. The corpus also highlights the importance of investing in education and training as a means of strengthening human capital for sustainable development, with recurring keywords such as "capacity building," "skills development," and "education." Additionally, the emergence of terms such as "AI for development," "knowledge sharing," and "AI-driven innovation" reflects ASEAN's strategic focus on leveraging artificial intelligence and digital solutions to enhance sustainability efforts. This emphasis on technological advancement suggests that ASEAN is actively integrating digital transformation into its broader development framework, ensuring that innovation is harnessed to support economic, social, and environmental objectives across the region.

Discourse Patterns

The corpus reveals that ASEAN's discourse on sustainable development is deeply rooted in a language of responsibility, as evidenced by the frequent use of words such as "commit," "ensure," and "must." These terms reinforce ASEAN's dedication to fostering sustainable growth, particularly in the context of AI-driven knowledge management and Urban Information Systems for effective development practices. The inclusive language found in the corpus, including pronouns like "we," "our," and "us," further highlights ASEAN's emphasis on collective responsibility and regional cooperation in achieving sustainability objectives. Additionally, the corpus suggests that ASEAN aligns its strategies with international agreements such as the SDGs and the Paris Agreement, demonstrating a commitment to global sustainability standards. This alignment is reflected in ASEAN's contributions to AI innovations and smart city technologies, which are framed using aspirational language aimed at long-term progress. Terms such as "achieve," "enhance," and "innovate" are used to articulate ASEAN's vision for a resilient future, underlining the role of AI-enhanced data and AI systems in knowledge management, best practice sharing, and progress monitoring. Moreover, the analysis highlights the necessity of fostering synergies among diverse stakeholders, including governments, the private sector, and civil society, to optimise the use of AI and Urban Information Systems for governance and resource management. ASEAN's a communication strategies consistently emphasise compliance with global norms, evidence-based practices, and inclusivity, while promoting economic growth, environmental sustainability, social equity, and technological innovation. This comprehensive approach underscores ASEAN's efforts to integrate digital transformation into its broader sustainable development framework.

Analysis of ASEAN's Sustainable Development Values in Bangkok, Thailand

The study examines urbanisation, environmental conservation, economic development, social inclusion, and climate change in Bangkok, Thailand, by analysing

the extent to which ASEAN's principles of sustainable development are incorporated into local policies and practices.

Urban Planning and Infrastructure Development

Key terms: Smart City Initiatives, Green Building Standards, Thai Green Building Institute (TGBI).

The analysis reveals that terms such as 'smart city initiatives' and 'green building standards' indicate Bangkok's alignment with ASEAN's focus on sustainable urban development. In this context, ASEAN's Urban Information Systems (UIS) are expected to play a role in smart city planning, while the Thai Green Building Institute (TGBI) certifications underscore Thailand's commitment to energy-efficient construction. This reflects the nation's consistent application of sustainable development principles as outlined in the ASEAN Community Blueprint.

Environmental Protection and Resource Management

Key terms such as 'waste management policies,' 'water resource management,' 'Chao Phraya River restoration,' 'sustainable tourism,' 'green businesses,' and 'incentives' highlight the development of effective management practices. The terms 'waste management policies' and 'water resource management' reflect Bangkok's commitment to addressing environmental concerns. Water treatment and efficient resource utilisation remain central to ASEAN's environmental agenda, with Bangkok's initiatives exemplified by the Chao Phraya River Restoration Project. In line with ASEAN's focus on economic sustainability, Bangkok's emphasis on sustainable tourism and green businesses demonstrates its proactive approach to ecological entrepreneurship within the region.

Social Inclusivity and Community Development

The corpus highlights the role of community engagement in driving sustainable development. Key pillars of local policies include climate resilience, renewable energy, and sustainable growth, all of which rely on active participation from local communities to ensure effective implementation and long-term success.

Climate Change Mitigation and Adaptation

The implementation of this solution necessitates the incorporation of key terms such as 'climate resilience,' 'renewable energy,' and 'flood management,' alongside the establishment of effective governance at the level of the disaster management authority and metropolitan government overseeing the urban area. The term 'climate resilience' appears 17 times in the corpus, while 'renewable energy' is mentioned over 200 times, and 'flood management' is frequently referenced, indicating Bangkok's preparedness for climate change. These align with ASEAN's Climate Agendas, highlighting the integration of AI-powered systems and knowledge management approaches to enhance urban resilience and mitigate climate-related risks.

Table 8: Frequency of Key Terms Related to Sustainability and Technological Innovation in ASEAN.

Term	Frequency
Climate Resilience	17
Renewable Sources of Energy	217
AI for Climate Resilience	50
Knowledge Management	75
Urban Information Systems	45

Table 9: Semantic and Sentiment Analysis of Key Themes in ASEAN's Sustainable Development Discourse.

Theme	Keywords	Description	Sentiment
Technology/ Innovation	Technology, innovation, new ideas, advancements, AI, smart technologies	Focus on applying new technologies, including AI, to promote sustainable development and innovation.	Positive
People/ Community	Community, people, social equity, inclusion	Emphasis on improving people's lives, fostering social inclusion, and using Knowledge Management for effective collaboration.	Positive
Environment/ Conservation	Environment, conservation, natural resources, protection, eco-innovation	Focus on environmental protection, conservation efforts, and the role of Urban Information Systems in managing resources.	Positive
Development/ Sustainability	Sustainable development, growth, progress, future, green growth	Commitment to balanced development that considers long-term sustainability, including AI for sustainable solutions.	Positive
Economy/ Employment	Economy, employment, economic growth, job creation, green economy	Emphasis on economic growth, job creation, and fostering a green economy supported by innovative solutions.	Positive
Climate Change/ Resilience	Climate change, resilience, adaptation, mitigation, AI for resilience	Focus on adapting to and mitigating the effects of climate change with AI-driven resilience strategies.	Neutral to Positive
Energy/Renewable Resources	Energy, renewable resources, clean energy, sustainability, AI-powered energy management	Emphasis on using renewable energy sources, promoting energy sustainability, and leveraging AI for energy management.	Positive
Social Equity/ Inclusion	Equity, inclusion, fairness, social justice, AI for social good	Focus on ensuring fair treatment, inclusion of all social groups, and leveraging AI for social good.	Positive
Improvement of People's Lives	Quality of life, wellbeing, living standards, smart city solutions	Efforts aimed at improving the overall quality of life through smart city solutions and AI-enhanced public services.	Positive

Semantic and Sentiment Analysis

ASEAN's approach to sustainable development is underpinned by key themes of sustainability, innovation, and regional cooperation, as identified through semantic analysis of the selected corpus. Technology and innovation emerges as a significant theme, where AI and smart technologies play a crucial role in advancing ASEAN's sustainability and innovation objectives. The role of knowledge management is equally vital in fostering collaboration and achieving shared goals among diverse communities. The people and community theme underscores ASEAN's commitment to enhancing living standards, promoting social equity, and fostering inclusion. Additionally, environmental protection and eco-innovation highlight ASEAN's utilisation of AI in resource management and Urban Information Systems to support natural resource conservation and environmental sustainability. ASEAN's sustainable development agenda also integrates green growth principles and AI technologies as mechanisms for achieving long-term economic, social, and environmental balance. The economy and employment theme reflects ASEAN's focus on economic growth and job creation, with an emphasis on green economies and technological integration. The climate change and resilience theme outlines ASEAN's strategies for addressing climate change through resilience and adaptation, leveraging AI-driven solutions. Similarly, the energy and renewable resources theme stresses the adoption of renewable energy and AI-based energy management systems to enhance efficiency and sustainability. The corpus further emphasises social equity and inclusion, particularly in relation to social justice, gender equality, and economic inclusion, with AI-driven initiatives fostering sustainable practices for all groups. Lastly, the improvement of people's lives theme highlights ASEAN's vision for enhancing quality of life through smart city solutions, AI-powered public services, and Urban Information Systems, thereby creating more sustainable, liveable, and inclusive urban environments.

The Value of ASEAN Sustainable Development: An Analysis of its Corpus in Bangkok, Thailand

The study further explores how ASEAN's sustainability values are reflected in local policies and actions in Bangkok, Thailand, particularly in urbanisation, environmental conservation, economic development, social inclusion, and climate change. Key terms such as 'smart cities,' 'climate resilience,' 'AI,' and 'renewable energy' emerging from the analysis suggest that ASEAN's sustainability agenda aligns with Thailand's local initiatives. Urban planning and infrastructure development is the predominant theme, with terms such as 'smart city initiatives,' 'green building standards,' and 'urban information systems' indicating Bangkok's commitment to sustainable urban development. Policies and strategies employing AI-driven systems for optimising resource use, waste management, and energy efficiency are integral to urban governance. In line with ASEAN's sustainable development objectives, the Thai Green Building Institute (TGBI) certifications promote energy-efficient construction practices.

Regarding environmental protection and resource management, the corpus highlights waste management policies, water resource management strategies, and the Chao Phraya River Restoration Project. These terms strongly correlate with environmental conservation and resource efficiency, which are core elements of ASEAN's agenda. Real-time monitoring and management of resources, supported by AI and knowledge management systems, further facilitate sustainability efforts. Additionally, Bangkok's emphasis on sustainable tourism and eco-friendly businesses aligns with ASEAN's broader eco-innovation goals. The theme of social inclusivity and community development underscores Bangkok's focus on social equity through poverty reduction and inclusive growth policies. The corpus highlights AI for social good as a means to enhance quality of life by improving healthcare, education, and public services in line with technological advancements. Knowledge management systems facilitate the sharing of social inclusion strategies among ASEAN member states.

In relation to climate change mitigation and adaptation, the analysis reveals Bangkok's preparedness for climate-related challenges. The frequent use of terms such as 'climate resilience,' 'renewable energy,' and 'flood management' underscores the city's commitment to addressing climate change impacts. AI-driven flood management solutions and renewable energy initiatives contribute to enhancing long-term urban resilience. Urban information systems play a crucial role in developing climate adaptation strategies to anticipate and manage environmental challenges. The final analysis of the corpus suggests that Bangkok's sustainable development trajectory closely aligns

with ASEAN's regional sustainability goals through its innovative approaches, including AI, knowledge management, and urban information systems. These initiatives enable Bangkok to contribute to ASEAN's broader sustainability agenda, leveraging emerging technologies to achieve environmental, social, and economic resilience. Frequently occurring keywords such as 'sustainability,' 'AI,' 'knowledge management,' and 'urban information systems' illustrate the strong connection between ASEAN's development strategies and Bangkok's local initiatives. Enhancing urban planning, resource management, and climate adaptation remains central to ASEAN's commitment to sustainable development, with AI and knowledge management serving as key facilitators.

Conclusion

This study examines how ASEAN strategically employs language to advance its sustainable development agenda. Frequent use of terms such as 'sustainability' (494), 'resilience' (971), and 'inclusive growth' (100) underscores ASEAN's focus on long-term sustainable practices. Normative language, including 'must', 'should', and 'commit to', reinforces responsibility and compliance, while collocations like 'environment', 'responsibility', and 'societies' highlight ASEAN's emphasis on economic, environmental, and social sustainability. Key themes in ASEAN's discourse include economic integration, environmental protection, social justice, cooperation, and technological innovation. ASEAN's economic strategy prioritises green growth and equitable resource distribution. Terms such as 'climate change', 'carbon footprint', and 'biodiversity' reflect its environmental agenda, while 'poverty reduction', 'social welfare', and 'gender equality' emphasise social justice. Regional cooperation is central to ASEAN's vision, as reflected in the 'ASEAN spirit' narrative.

Innovation and technology, particularly AI, play a crucial role in ASEAN's sustainability efforts, as indicated by key terms such as 'innovation', 'technology', and 'sustainable solutions'. ASEAN relies on data-driven, evidence-based communication to justify its policies and ensure transparency. The case study of Bangkok exemplifies the local implementation of ASEAN's sustainability principles, incorporating 'smart city applications', 'green building measures', 'waste and water management', 'sustainable tourism', and 'climate change adaptation'. AI, Knowledge Management, and Urban Information Systems are integral to Bangkok's sustainable development strategies. The corpus reflects ASEAN's positive framing of sustainability, with terms such as 'growth', 'incentives', and 'improvement' reinforcing optimism. ASEAN's sustainability discourse aligns with Bangkok's local initiatives, demonstrating a cohesive strategy. The study concludes that ASEAN's communication on sustainability is comprehensive and effectively integrated into local policies. Further research should explore global sustainability trends, ASEAN's comparative performance, and the integration of digital solutions for sustainable development. Enhancing stakeholder engagement, aligning policies with global frameworks like the UN SDGs and Paris Agreement, and fostering public awareness will further strengthen ASEAN's sustainability initiatives.

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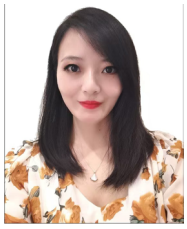

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