

## Conference Paper

# Multi-Level Governance in Addressing Climate Change in Indonesia, Malaysia and Singapore: Systematic Literature Review

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## Abstract.

The utilization of multilevel governance (MLG) is a significant factor in effectively addressing the challenges posed by climate change in Indonesia, Malaysia, and Singapore. The objective of this study is to examine the significance of MLG in mitigating the effects of climate change and its ramifications for policymaking and proficient governance. The present research has identified the importance of intergovernmental collaboration and coordination, along with the active participation of diverse stakeholders such as civil society organizations and the private sector. The investigation employed a Systematic Literature Review approach. Through an analysis of the experiences and practices of these nations, this study elucidates the pivotal elements that facilitate an efficacious response to climate change. Additionally, this study addressed the obstacles and constraints faced during the implementation of the MLG methodology. The results presented herein enhance the comprehension of the function of MLG in mitigating climate change. They also offer valuable perspectives for policymakers and practitioners to formulate effective strategies and policies that foster sustainable development and resilience in the context of climate change in Indonesia, Malaysia, and Singapore.

**Keywords:** multi-level governance, climate change, Indonesia, Malaysia and Singapore

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## 1. Introduction

Climate change has emerged as a pressing and intricate predicament that confronts nations worldwide. To effectively mitigate and adapt to the impacts of climate change, it is imperative that coordinated and collaborative efforts be undertaken across multiple government levels. The notion of multi-level governance (MLG), or tiered governance, is gaining increasing attention as a viable approach.

According to Letchumanan [1], Indonesia, Malaysia, and Singapore are nations in the Southeast Asian region that are actively engaged in endeavors pertaining to climate change mitigation and adaptation. In the face of various obstacles and intricacies, these

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nations have implemented a Multi-Level Governance (MLG) strategy to address climate change.

The multi-level governance (MLG) approach, when applied to the issue of climate change, acknowledges the significance of cooperation and engagement among diverse tiers of government, comprising central and local authorities, alongside the dynamic involvement of other actors, such as non-governmental organizations, the private sector, and civil society. By adopting this approach, there is the potential for improved integration of climate change mitigation and adaptation efforts, formulation of more comprehensive policies, and more effective allocation of resources.

Research conducted in Indonesia, Malaysia, and Singapore has yielded valuable insights into the role of the MLG in addressing climate change within these regions. The research endeavors encompass a range of methodologies, such as comparative analysis, detailed case studies, policy appraisal, stakeholder involvement, intergovernmental interactions, institutional proficiency, knowledge dissemination, and enduring viability of climate change initiatives.

The study conducted by Coen et al. [2] highlights the significance of intergovernmental cooperation in tackling intricate and multifaceted issues, as evidenced by the MLG's strategy for mitigating climate change in Indonesia, Malaysia, and Singapore. Indonesia faces distinctive challenges within its contextual framework, including deforestation, forest degradation, and food security, all of which are susceptible to climate change impacts. Studies conducted on the execution and difficulties associated with REDD+ in Indonesia have provided valuable observations concerning the decision-making process pertaining to land utilization, involvement of indigenous establishments, and the need for enhanced adaptive capacity.

Research conducted in Malaysia has emphasized the identification of sector-specific challenges and opportunities in relation to climate change adaptation strategies. Tailored adaptation measures are required to address sector-specific vulnerabilities such as those pertaining to agriculture, tourism, and natural resource management. Furthermore, scholarly investigations aimed at enhancing Environmental Impact Evaluation (EIA) procedures underscore the significance of engaging proficient environmental consultants in enhancing the caliber and meticulousness of evaluations. This is essential for ensuring that policy planning and implementation are more efficacious and enduring.

Singapore's island nation, which faces constraints in terms of its natural resources, has implemented a range of policy measures to address the issue of climate change [3]. Studies incorporating stakeholder engagement and local community perspectives have revealed the significance of inclusivity and participation in decision-making procedures.

This approach facilitates the accommodation of diverse interests and enhances the relevance and acceptance of mitigation and adaptation efforts within a community.

It is imperative to recognize that certain obstacles and constraints exist in both the investigation and execution of MLG with respect to addressing climate change within the aforementioned three nations. Challenges in climate change governance are multifaceted, encompassing data limitations, methodological limitations, and the complexities of representing the diverse social, economic, and environmental factors that impact this issue in different countries. Consequently, additional research that expands the geographical range, sectoral coverage, and stakeholder viewpoints is imperative to enhance the comprehension of the contribution of multi-level governance (MLG) in mitigating climate change in Indonesia, Malaysia, and Singapore.

Ulum and Ngindana [4] expressed optimism that a better understanding of the function of MLG in mitigating climate change in the aforementioned nations will lead to the identification of prospects for enhancing regional collaboration, refining current policies and governance, and bolstering institutional proficiency in tackling climate change predicaments. Therefore, more efficient mitigation and adaptation strategies should be implemented to enhance the capacity of individuals in Indonesia, Malaysia, and Singapore to cope with the impacts of climate change. Collaboration among nations in the pursuit of collective resolutions, exchange of expertise and insights, and enhancement of governmental coordination may serve as pivotal factors in effectively addressing the issue of climate change.

Furthermore, an enhanced comprehension of the function of the MLG in mitigating climate change can serve as a foundation for enhancing policy and governance across national, regional, and local domains. Incorporating stakeholders from diverse sectors and government levels can result in decisions that are more representative of broader societal needs and aspirations. According to Schmitter [5], policy legitimacy can be enhanced and more sustainable solutions can be generated through increased active participation from the community.

Recognition and addressing of current challenges and limitations are essential for the management of climate change. Enhancing the accessibility of high-quality data, devising more inclusive research methodologies, and broadening the purview of research to encompass a more diverse array of regions, sectors, and stakeholder cohorts necessitate concerted collaborative endeavors. The present study aims to enhance the comprehension of MLG (multilevel governance) dynamics concerning climate change in Indonesia, Malaysia, and Singapore.

To guarantee the longevity of endeavors aimed at addressing climate change, it is imperative to consider institutional capacity. Brown et al. [6] suggested that there is a need for the government to enhance the capabilities of relevant institutions in the development, execution, and evaluation of climate change policies. Capacity enhancement can be achieved through training, education, and knowledge exchange among nations, as posited by Krisnanto and Suryawati [7]. Furthermore, bolstering endeavors to tackle climate change can be reinforced by backing from public, private, and international institutions.

Indonesia, Malaysia, and Singapore have significant potential to address climate change through enhanced collaboration and steadfast dedication within the MLG framework. Through the implementation of inclusive policies, bolstering of governance structures, and elevation of public awareness and participation, these three nations have the potential to serve as a model for other global regions in their efforts to effectively address the pressing issue of climate change. It is imperative to sustain research and foster international collaboration in order to enhance comprehension and generate inventive and enduring resolutions to address climate change. The objective of this scholarly article is to conduct an analysis of multilevel governance as a means of addressing climate change in Indonesia, Malaysia, and Singapore.

## 2. Methods

The present study constitutes an exploratory investigation that seeks to attain a more profound comprehension of the subject matter of multilevel governance (MLG) in addressing the issue of climate change within the contexts of Indonesia, Malaysia, and Singapore. The objective of this investigation was to examine the requisite data and information for formulating more precise inquiries that will be addressed in subsequent or forthcoming research. Through exploratory research, scholars can acquire adequate comprehension to formulate and execute more methodical and comprehensive research. The methodology of conducting a systematic literature review involves utilizing the software tool Publish or Perish to conduct a comprehensive search for the most recent scholarly articles. Subsequently, the software tool Vosviewer was employed to scrutinize and evaluate the interrelationships among the latest studies.

### 3. Results and Discussion

A total of 567 articles were extracted from the following three databases: Scopus, PubMed, and Google Scholar. This study comprised 150 instances of duplication. A total of 111 incomplete-text articles and duplicate entries were eliminated from the three databases. The remaining 306 articles were retained because of complete full-text availability. Subsequently, complete articles were subjected to a secondary screening process to evaluate their eligibility. As a result, 297 articles were excluded from the study owing to their lack of relevance. The utilization of certain methods in systematic review articles may not be germane to the topic or may not align with the research questions at hand. Nine studies met the inclusion criteria for analysis in the examination of multilevel governance in addressing climate change in Indonesia, Malaysia, and Singapore, based on the full-text and non-duplicate articles.

The examination of multilevel governance in the context of climate change mitigation and adaptation efforts in Indonesia, Malaysia, and Singapore yielded significant and noteworthy findings. Initially, the authors acknowledged the pivotal significance of multilevel governance in effectively tackling climate change. The aforementioned studies underscore the significance of harmonization and cooperation among diverse tiers of governance, encompassing national, regional, and municipal entities, alongside the dynamic engagement of non-governmental entities, including civil society groups and commercial enterprises. This study highlights the necessity of policy integration, stressing the significance of harmonizing mitigation and adaptation endeavors within the wider policy frameworks of the concerned nations. The focal point is the incorporation of social, economic, and environmental aspects of sustainability within the framework of climate change policies.

Furthermore, stakeholder involvement has been identified as a crucial element in the governance of climate change [17]. This research highlights the significance of employing an all-encompassing and collaborative methodology that encompasses a diverse array of stakeholders, such as regional communities, aboriginal factions, and susceptible demographics. This guarantees the efficacy and validity of the measures taken to address climate change. This study highlights the significance of enhancing institutional capacity across all government levels, encompassing technical knowledge and expertise, as a crucial element in addressing climate change challenges efficiently. Capacity-building has emerged as a pivotal aspect in this regard.

TABLE 1: Characteristics or summary of findings from articles included in the study.

Title	Author	Design	Results
Climate Change Adaptation in Malaysia	Joy Jacqueline Pereira & Mohd Khairul Zain [8]	Case Studies	Climate change risks associated with biomass and biofuel production, waste management, disease burden and coastal adaptation as well as institutional, technological and resource capacity challenges
Multilevel (mis)governance of palm oil production	Natasha Hamilton-Hart [9]		Industry-related governance failures stem from competing interests of different stakeholders in the context of a highly unequal distribution of wealth and power. Misgovernance is not an unintended consequence of institutions failing to compete with markets in scale and scope, but is embedded in multilevel governance regimes that underpin, and partially regulate, industries.
Governing Climate Change In South-east Asia: Critical Perspectives	Jens Marquardt et al. [10]	Case Studies	Empirical findings from diverse environments are combined into cross-country comparisons that make it possible to elaborate similar patterns while at the same time identifying different features of climate change governance in Southeast Asia. Taking case studies from all Southeast Asian countries, namely Brunei Darussalam, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand, Timor-Leste, and Viet Nam, this book will be of great interest to students, scholars, and practitioners dealing with climate change and environmental governance
Multi-level governance for climate change in Indonesia	Jabeen, H., & Pasa, A. [11]	Case Studies	Subnational levels of government can contribute to the development of national climate policies and implementation plans. This fact sheet outlines some of the ways that this is already happening and recommends further improvements
Mainstreaming climate adaptation and mitigation policy: Towards multi-level climate governance in Melaka, Malaysia	Irina Safitri Zen, Abul Quasem Al-Amin, Brent Doberstein [12]	Case Study	The findings of this study should inform the implementation of multi-level governance in other states in Malaysia and elsewhere with similar ecological and economic contexts.
Multi-level governance as a cause of lacking institutional capacity in the application of land value capture at large infrastructure projects in Indonesia	Wal, Sanne van der [13]	Literature Review	Through theoretical insights in institutional capacity issues and multi-level governance, appropriate conceptual and predictive models are developed. Multi-level governance as a cause of lack of institutional capacity in the application of land value capture on large infrastructure
Climatic changes, government interventions, and paddy production: an empirical study of the Muda irrigation area in Malaysia	Ahmad Zubir Ibrahim and Md. Mahmudul Alam [14]	Case Studies	To ensure increased rice production as well as minimise the impact of climate change, government intervention should continue in Malaysia

TABLE 1: (Continued).

Title	Author	Design	Results
Cities and climate change mitigation: Economic opportunities and governance challenges in Asia	Andy Gouldson et al. [15]	Case Studies	The presence or absence of governance arrangements that enable the implementation of low-carbon development strategies in Asian cities will have global implications for climate change
Green building project management: obstacles and solutions for sustainable development	Bon-Gang Hwang, Jac See Tan [16]	Survey Studies	Although project cost is a major barrier among others in green building construction management, there is no shortage in sustainable knowledge in Singapore's construction industry

The exchange of knowledge and collaborative efforts among nations in the region is regarded as a significant means of achieving mutual learning and sharing of optimal methodologies. According to Lian and Robinson [18], there is significant potential for Indonesia, Malaysia, and Singapore to enhance their climate change governance and policy implementation by leveraging shared experiences. Furthermore, this study underscores the significance of a robust system for assessing and overseeing policies. The implementation of climate change policies necessitates regular evaluation of their efficacy and impact as well as the utilization of evidence-based decision-making. This is essential for guaranteeing the ongoing enhancement of the governance approach.

Schreurs [19] highlighted the significance of adopting a comprehensive and integrated approach to climate change governance, wherein multilevel governance assumes a crucial function. This research offers significant perspectives on the obstacles and possibilities that these nations encounter when tackling climate change. The significance of collaborative endeavors, stakeholder involvement, skill development, and policy amalgamation is underscored for the effective implementation of measures aimed at mitigating and adapting to climate change. These discoveries enhance the comprehension of the function of multilevel governance in tackling climate change in Indonesia, Malaysia, and Singapore. Additionally, they offer valuable directions for future policy and research endeavors in the area.

### 3.1. Research Implication

Several key findings have been identified in research on multilevel governance in addressing climate change in Malaysia. Initially, the statement underscores the significance of engaging environmental non-governmental organizations (NGOs) in the

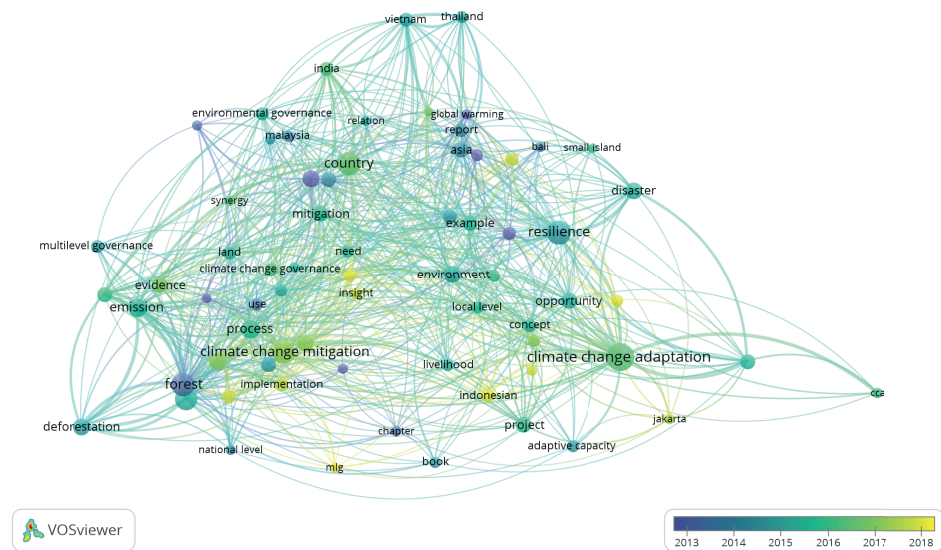


Figure 1: previous studies Implication.

management of climate change. This is because their active involvement enhances the inclusivity and efficacy of the decision-making process. The aforementioned statement underscores the necessity of fostering alliances and cooperative efforts between governmental entities and non-governmental organizations (NGOs) to enhance climate change governance within Asian nations.

Research endeavors that focus on strategies for adapting to climate change have brought to light the distinct challenges and prospects encountered by diverse sectors. The implications of this situation indicate the necessity of implementing customized and suitable adaptation measures that target vulnerabilities specific to each sector and foster resilience. Sarzynski [20] highlighted the significance of implementing a comprehensive and industry-specific strategy for adapting to climate change.

A noteworthy discovery pertains to the escalating implementation of the Environmental Impact Assessment (AMDAL) in Malaysia. This study highlights the significance of integrating the viewpoints of environmental consultant professionals to enhance the standards and precision of evaluations. This statement suggests that there is a requirement for ongoing enhancement in the implementation of Environmental Impact Assessment (EIA) and the development of expertise among individuals engaged in performing assessments.

The incorporation of sustainable practices has emerged as a crucial element in addressing the obstacles posed by climate change as per Zeigermann's [21] findings.



Research investigating the interconnections between environmentally conscious manufacturing techniques, sustainable tourism, and resource management highlights the significance of incorporating sustainability principles across diverse domains. These implications entail the incorporation of sustainable practices, policies, and frameworks to advance environmental and social sustainability.

This study highlights the significance of a robust legal and regulatory structure in tackling climate-related issues within the legal sector. These results underscore the necessity of formulating and implementing climate-oriented legal frameworks and standards to bolster the pursuit of sustainable growth and climate adaptability across Asian nations.

The involvement of stakeholders and incorporation of community perspectives are crucial factors in climate change initiatives, as highlighted by Khan et al. [22]. This research has highlighted the significance of involving a wide range of stakeholders and considering local viewpoints, especially in programs and initiatives related to youth leadership and tourism. This highlights the necessity of employing participatory methodologies and engaging local communities in decision-making procedures to guarantee the efficiency and approval of climate-change measures.

The significance of collaborative governance, sector-specific adaptation strategies, improved valuation practices, sustainable practices, legal frameworks, and stakeholder engagement in tackling climate change challenges and advancing sustainable development in Asian nations has been widely acknowledged. These discoveries offer significant perspectives for policymakers and professionals to enhance climate change governance structures and facilitate efficient climate measures within the nation.

### 3.2. Study Limitations

A significant constraint that many studies face is the possibility of the limited generalizability of their findings, which can be attributed to their narrow focus on particular regions, sectors, or stakeholder groups. The restricted scope of this study may impede the generalizability of the findings to diverse settings within Malaysia or across nations. Furthermore, the diminutive sample sizes in certain investigations may constrain the representativeness of the results and elicit apprehensions regarding the statistical dependability.

Challenges of data availability and quality are also pertinent issues. Certain research endeavors may depend on secondary data or encounter challenges in obtaining pertinent data, which could result in potential lacunae or partialities in the analysis. Constraints pertaining to data may impede the attainment of a holistic comprehension of the effects of climate change and the corresponding measures taken by governing bodies. Furthermore, the selection of research methods and data collection techniques can result in methodological constraints. Self-reported surveys or interviews may introduce response bias, while qualitative studies may exhibit limited generalizability.

Research findings can be influenced by time constraints, particularly when the studies are conducted within a restricted period. The restricted extent and range of the analysis impede the capacity to encompass the enduring consequences and efficacy of climate change governance and adaptation tactics. Furthermore, research endeavors that involve stakeholder engagement or community perspectives may encounter obstacles to guaranteeing a broad range of representation and inclusivity. The limited inclusion of marginalized or underrepresented groups has the potential to impact the comprehensiveness of the findings.

Comprehension of climate change necessitates interdisciplinary contemplations. However, certain investigations may concentrate predominantly on particular disciplines, disregarding the more extensive systemic interconnections and intricacies implicated in climate change governance and adaptation [23]. The generalizability of this study's findings to other regions of Malaysia may be limited by contextual factors specific to the study area. This is because of the potential variation in social, economic, and environmental factors across different regions.

Recognizing the aforementioned limitations is crucial in accurately interpreting research outcomes and identifying domains that require additional research and data-gathering endeavors. The rectification of these constraints would facilitate the enhancement of understanding of climate change governance and adaptation in Malaysia. This, in turn, would enable the formulation of more efficacious policies and strategies to tackle the predicaments of climate change.

### 3.3. Further Research Recommendations

To further our understanding of the function of multilevel governance in addressing climate change in Indonesia, Malaysia, and Singapore, future research could employ diverse methodologies. It is advisable to conduct a comparative analysis to make a direct comparison of the governance structures, policies, and practices of nations. Through the

analysis of similarities and differences, significant insights can be obtained concerning the efficacious responses to climate change. An examination of case studies that concentrate on particular initiatives or policies within a multilevel governance framework can provide comprehensive perspectives on the difficulties, prospects, and functions of diverse stakeholders. Furthermore, studies on policy evaluation can analyze the efficacy of extant policies pertaining to climate change, thereby providing direction for the formulation of precise and resilient measures. Examination of stakeholder engagement and participation has the potential to provide insights into the implementation of inclusive decision-making procedures. Investigating intergovernmental dynamics can provide insights into power dynamics and coordination mechanisms, as posited by Ge et al. [24] Evaluation of institutional capacity has the potential to identify deficiencies and recommend approaches to enhance implementation. According to Uyarra et al. [25] promoting knowledge transfer and fostering learning among these nations has the potential to improve regional collaboration. Examining the enduring viability of climate change initiatives is of utmost importance, as it guarantees their assimilation into long-range development strategies. By directing research efforts towards this particular domain, future studies can potentially enhance the efficacy of climate change governance, provide valuable insights for policy formulation, and promote regional cooperation to tackle climate-related issues in Indonesia, Malaysia, and Singapore.

## 4. Conclusion

The significance of multilevel governance in addressing climate change cannot be exaggerated. Notwithstanding, there are obstacles that need to be surmounted to guarantee efficacious climate action at the local, regional, and national levels, including but not limited to policy coordination, resource mobilization, decision-making, and stakeholder engagement. Effectively tackling this challenge requires robust collaborative mechanisms, unambiguous delineation of roles and obligations, appropriate allocation of resources, and inclusive governance procedures. Through the resolution of these challenges, nations can enhance their climate change governance structures and augment their ability to tackle the consequences of climate change efficiently.

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