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ASEAN's Adaptive Institutional Responses to Transboundary Haze Pollution

Ryu, Sang Hee*, and Lee, Jae-Woo**

[*Abstract*]

Transboundary haze pollution remains a recurrent environmental and political challenge in Southeast Asia. This article analyzes how the Association of Southeast Asian Nations (ASEAN) has institutionalized cooperation to address this issue, highlighting its shift from fragmented to more structured but flexible governance. Drawing on an integrated framework that combines transaction cost economics, regime theory, and commons governance, the study traces ASEAN's progression from low to medium institutionalization across four key milestones: the 1995 ASEAN Cooperation Plan, the 1997 Regional Haze Action Plan, the 2002 ASEAN Agreement on Transboundary Haze Pollution, and its subsequent implementation. Rather than interpreting ASEAN's trajectory as institutional stagnation, it argues that ASEAN's emphasis on consensus, informality, and non-interference reflects a strategic adaptation to regional interdependence, sovereignty sensitivities, and political diversity. The analysis demonstrates how medium institutionalization has enabled cooperation in a region where centralized enforcement is not feasible. By

* Ph.D. Candidate, Graduate School of International Studies, Pusan National University, South Korea. blessedjoy117@gmail.com.

** Professor, Graduate School of International Studies, Pusan National University, South Korea. Corresponding Author. aggieljw@naver.com.

institutionalizing haze governance through a loosely coupled but resilient framework, ASEAN's approach offers lessons for regions confronting transboundary environmental challenges and collective action dilemmas under sovereignty constraints.

Keywords: ASEAN, transboundary haze pollution, institutionalization, environmental governance, ASEAN Way

Ⅰ. Introduction

Transboundary air pollution is a serious and growing environmental challenge. When pollutants cross national borders, it becomes difficult for any single country to manage air quality on its own. These challenges often involve multiple countries, shared ecosystems, and conflicting interests. As a result, regions around the world have adopted varying institutional approaches to address this issue, shaped by their political relationships, environmental needs, and capacity for cooperation.

In Europe, concerns over acid rain in the 1970s and 1980s led to the creation of the Convention on Long-Range Transboundary Air Pollution (CLRTAP). Supported by international scientific collaboration, the agreement expanded through several protocols to regulate a wide range of pollutants. Over time, it became more precise and widely adopted, offering a clear example of how step-by-step, science-based cooperation can lead to meaningful reductions in cross-border emissions (Byrne 2015; Perrin and Bernauer 2010). The CLRTAP's success reflects a well-developed legal framework, backed by systematic monitoring and international engagement (OECD 2020). A similar issue in North America—acid rain affecting both Canada and the United States—prompted a coordinated but more limited institutional response, shaped primarily by U.S. domestic reforms and bilateral negotiation. After years of political disagreement, changes in U.S. environmental policy paved the way for the 1991 Canada-U.S. Air Quality Agreement. Although the Agreement does not include strict enforcement

mechanisms, it introduced long-term targets, regular reporting, and joint monitoring, demonstrating how bilateral cooperation can still yield sustained institutional responses (Munton 1997; OECD 2020). In Northeast Asia, seasonal dust storms from China and Mongolia affect the air quality of countries such as South Korea and Japan. Unlike Europe and North America, this region has not developed binding legal agreements (Lee 2010; OECD 2020). Instead, countries in the region have pursued more flexible institutional arrangements due to political sensitivities and the absence of shared enforcement mechanisms. These efforts include the North-East Asian Subregional Programme for Environmental Cooperation (NEASPEC), the Tripartite Environment Ministers Meeting (TEMM), and the Acid Deposition Monitoring Network in East Asia (EANET), all of which prioritize dialogue and data sharing (Lee 2010; OECD 2020). The launch of the North-East Asia Clean Air Partnership (NEACAP) in 2018 further reflects an emerging interest in strengthening institutional coordination, albeit through voluntary participation (OECD 2020). In South Asia, the Hindu Kush Himalaya (HKH) region faces worsening air pollution from both local sources, such as urban emissions and agricultural burning, and cross-border transport. While no formal agreement has been established, science-based platforms such as the Hindu Kush Himalayan Monitoring and Assessment Programme (HIMAP), led by the International Centre for Integrated Mountain Development (ICIMOD), have promoted regional knowledge-sharing and policy discussions. However, institutionalization remains limited and continues to depend on national-level action (Saikawa et al. 2019). All these regional cases illustrate a spectrum of institutional responses—from legally binding frameworks to informal, cooperative networks—shaped by each region's specific political, environmental, and diplomatic conditions.

Against this backdrop of varying degrees of institutionalization, this paper focuses on the pressing case of transboundary haze pollution in Southeast Asia. Each year, countries in the region suffer from recurring haze events caused by peatland and forest fires (ASEAN Secretariat 2021). This disaster is a byproduct of a natural phenomenon and human activities, namely, El Niño that delays rainfall and the slash-and-burn practices that are conducted by palm

oil and timber industries for cost efficiency (ASEAN Secretariat 1995; Litta 2012; Zhang and Savage 2019). Mostly, the fires break out in Sumatra and Kalimantan, Indonesia and the resultant haze envelops not only the source country, but also neighboring countries such as Singapore, Malaysia, Brunei, Thailand, and the Philippines; Singapore and Malaysia are the most affected due to their geographic proximity (Hidayat 2016; Litta 2012; Varkkey 2018). The consequences are wide-ranging—releasing greenhouse gases, harming public health, disrupting education and transportation, and reducing economic productivity (ASEAN Secretariat 2021). For example, according to the World Bank (2019: 7), when one of the most hazardous fires occurred in Indonesia in 2019, more than 900,000 people suffered from a respiratory health issue, 12 national airports were put to a standstill, a multitude of schools in Indonesia, Malaysia, and Singapore had to close, and lastly, the source country lost approximately US$ 5.2 billion, about 0.5% of its GDP that year.

As the regional institutional platform, ASEAN has become increasingly engaged in addressing this challenge. While ASEAN initially resisted environmental rule-making, particularly during the 1980s and early 1990s, when it opposed efforts to impose environmental trade regulations, its institutional orientation has gradually shifted in response to growing political awareness and regional ecological interdependence. ASEAN has since adopted a more proactive institutional posture, developing region-wide frameworks, sub-regional initiatives, and formal agreements to manage shared environmental challenges. This trajectory has been shaped by the ASEAN Way, a distinct set of institutional norms emphasizing consensus, non-interference, informality, and sovereign equality (Nguitragool 2011a).

Yet ASEAN's institutional development continues to generate contrasting interpretations. Critics have pointed to the lack of enforcement in key agreements like the ASEAN Agreement on Transboundary Haze Pollution, adopted in 2002, as evidence of institutional weakness and elite-driven inaction (Alam and Nurhidayah 2017; Heilmann 2015; Varkkey 2014; 2020). Indonesia's delayed ratification, often seen as emblematic of the ASEAN Way's constraints, also reflected deep-rooted domestic economic interests

and sectoral lobbying, particularly in the palm oil and forestry sectors. These dynamics have reinforced the perception that ASEAN's informality allows national priorities to override regional commitments (Varkkey 2014; 2020). However, other scholars have argued that it is precisely this flexibility that has enabled ASEAN to sustain cooperation in a politically diverse and sovereignty-sensitive region. For instance, Acharya (2001; 2017) contends that ASEAN's reliance on informal norms and dialogue has provided a durable foundation for regional engagement in the absence of strong enforcement provisions or supranational authority. Complementing this perspective, Tan (2017) notes that although ASEAN has moved toward more rules-based mechanisms, the underlying logic of the ASEAN Way still guides how disagreements are managed, with a continued reliance on quiet diplomacy, procedural flexibility, and the avoidance of open confrontation. This enduring reliance on informal norms is also evident in ASEAN's handling of non-traditional security challenges, where recent institutional responses, such as transboundary haze governance, continue to reflect the core features of the ASEAN Way (Caballero-Anthony 2017).

This paper examines how ASEAN has institutionalized cooperation to address transboundary haze by developing an integrated analytical framework that bridges micro- and macro-level institutional theories. Specifically, it synthesizes Coase's theory of transaction costs and Williamson's governance structures, traditionally applied to firm and market-level organizations, with Keohane's concept of loosely coupled systems and Ostrom's principle of institutional diversity, which address broader questions of regime formation, intergovernmental cooperation, and commons governance. By extending these institutional perspectives to the regional level, this study analyzes how ASEAN's approach to haze pollution reflects adaptive institutionalization shaped by transaction costs, political sensitivities, and interdependence. While the ASEAN Way is often regarded as a limitation,[1] this study shows that its emphasis on flexibility, non-interference, and consensus has enabled the

[1] For critiques of the ASEAN Way's institutional limitations, particularly in the realm of environmental governance, see Aggarwal and Chow (2010); Alam and Nurhidayah (2017); Heilmann (2015); Nguitragool (2011b); Varkkey (2014; 2020).

construction of cooperative mechanisms that are politically viable and regionally grounded. Rather than evaluating ASEAN's institutional development against universal benchmarks, it argues that each stage, whether weakly coordinated or more formalized, reflected an optimal response to regional conditions. In doing so, the paper not only contributes to broader debates on institutional adaptation in politically complex environments, but also offers a novel application of institutional theory to Southeast Asia's cross-border environmental governance, recasting ASEAN's medium-level institutionalization not as stagnation, but as a strategic, adaptive mode of governance in contexts where formal legalization remains politically sensitive or constrained. The paper proceeds as follows: Section II outlines the analytical framework, introducing the tragedy of the commons and key institutional theories that serve as the theoretical foundation for this study's institutionalization approach. Section III traces ASEAN's institutional responses to haze pollution through this lens. Section IV discusses the findings and their implications, and Section V concludes the paper.

Ⅱ. Theoretical Framework: Institutional Approaches to Commons Governance

2.1. Institutional Approaches to the Tragedy of the Commons

Garrett Hardin's (1968) seminal work, "The Tragedy of the Commons," illustrates how rational individuals, acting in their self-interest, can deplete shared resources, ultimately leading to collective ruin. He critiques the notion of unconstrained individual freedom, a state in which no form of regulation or collective oversight exists (Hardin 1968). To address this, he proposes two solutions: privatization and state regulation (Hardin 1968). While assigning property rights may mitigate overuse (Gordon 1954; Scott 1955),[2] this approach is often impractical for resources like air or

[2] The property rights literature attributes the commons problem to "nonexclusive-use rights," or open access (Karpoff 2022: S67-70). Gordon (1954: 135) notes, "everybody's property is nobody's property," which leads to overexploitation. Using

water. Legal regulations, though potentially effective, can be inadequate due to enforcement limitations and institutional corruption (Hardin 1968). As he states, "But we can never do nothing. That which we have done for thousands of years is also action. It also produces evils" (Hardin 1968: 1247). Hardin thus emphasizes that maintaining the status quo is itself a form of action, one that produces consequences and cannot be treated as neutral or benign (Hardin 1968).

In response, scholars have identified institutional approaches that go beyond binary solutions such as privatization or centralized authority. Institutions, defined by North (1991: 97) as "the humanly devised constraints that structure political, economic, and social interaction," offer frameworks that align incentives and enable cooperation under conditions of uncertainty and interdependence. These include both informal norms and formal rules, which reduce transaction costs, manage information asymmetries, and build trust among actors. Effective institutions raise the benefits of cooperation and increase the costs of defection, thereby enabling sustained collective action (North 1991). Keohane (1982) offers a parallel perspective from international relations, emphasizing that institutionalized cooperation among states emerges when the expected benefits of coordination outweigh the transaction costs involved in negotiating and maintaining agreements. In this respect, regimes help structure expectations, reduce uncertainty, and enable cooperation even in the absence of hierarchical authority (Keohane 1982). This framework helps explain why institutional responses to collective action problems vary in form and intensity depending on the strategic context. Coase (1960) reinforces this view by emphasizing that all institutional arrangements, whether market exchange, firm organization, or government regulation, carry inherent transaction and production costs. The task is to identify the most efficient institutional solution for a given context (Coase 1960).

Based on these insights, the following sections introduce a three-stage framework of institutionalization[3]—low, medium, and

fisheries as a case, Gordon (1954) and Scott (1955) argue that exclusive rights promote more efficient and sustainable resource use by clearly defining, allocating, and enforcing access (Karpoff 2022).

high—each capturing distinct ways in which institutions can be organized to address commons dilemmas and promote coordination.

2.2. Low Institutionalization: Fragmented Institutional Arrangements

Low institutionalization refers to informal, ad hoc, or minimally structured arrangements in which actors operate without robust mechanisms for enforcement or coordination. Coase (1960) illustrates this through the classic example of a rancher whose cattle stray onto a neighboring farmer's land, causing crop damage. Rather than focusing solely on liability, he emphasizes the reciprocal nature of harm and proposes that, in a world of zero transaction costs, private bargaining could efficiently resolve such disputes. Regardless of who holds the legal right, parties could negotiate to reach a mutually beneficial outcome (Coase 1960). However, Coase (1960) also acknowledges that in real-world settings, where transaction costs are high, information is imperfect, and enforcement is difficult, such bargaining becomes impractical. In these contexts, institutions become necessary to reduce the frictions of exchange. Coase (1960) argues that all institutional arrangements involve costs, and the goal is to identify the most efficient one for the context.

Williamson (1991; 2000) builds on this by identifying simple market structures as the dominant form at low levels of institutionalization. These arrangements are characterized by autonomous contracting, minimal interdependence among parties, and limited institutional commitments. Conflicts are resolved through courts, and actors operate independently under the assumption of clear entry and exit terms (Williamson 1991; 2000; 2003; 2008). However, Williamson (2000) also points out that economic actors are boundedly rational and self-interested, meaning they may exploit contract gaps or act opportunistically. As a result, informal or fragmented institutions often fail to support cooperation when transactions become complex or strategic behavior becomes likely (Williamson 2000).

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[3] These stages correspond to what are called "market," "hybrid," and "hierarchy" in economic theory (Williamson 1991: 269; 2003: 925), and to "highly fragmented collections of institutions," "loosely coupled systems of institutions," and "fully integrated institutions" in regime theory (Keohane and Victor 2011: 8).

This stage of low institutionalization is particularly ill-suited for managing transboundary environmental problems, where actors typically lack long-term commitments, share few mutual interests, and interact only sporadically. Without durable rules or coordinating mechanisms, sustained cooperation is difficult to achieve.

2.3. Medium Institutionalization: Diverse and Loosely Coupled Institutional Systems

Medium institutionalization refers to arrangements that are more formalized and stable than fragmented or informal mechanisms, yet do not rely on centralized authority. This middle range features loosely structured systems of institutions, offering a balance between flexibility and coordination.

Keohane (1982) argues that international cooperation can emerge in the absence of hierarchical enforcement through institutional frameworks that enable rule-making, reduce uncertainty, and facilitate reciprocity. Keohane (1998) and Keohane and Nye (1998) further highlight that increasing interdependence and information asymmetries heighten the demand for institutions that manage expectations and reduce collective action costs. Based on this, Keohane and Victor (2011: 8) introduce the concept of "loosely coupled systems of institutions," which allow for flexible, overlapping cooperation across governments, NGOs, and private actors without rigid control (Keohane and Victor 2011).

Ostrom (1990) and Ostrom et al. (1999) reinforce this view with the concept of institutional diversity. In contrast to Hardin's pessimistic outlooks, she demonstrates that communities across the world have developed durable institutional arrangements to govern common-pool resources. These self-organized systems blend informal norms with formal rules to produce sustainable outcomes without centralized authority. Ostrom (1990) and Ostrom et al. (1999) stress that no single institutional model fits all commons dilemmas; rather, institutional design must be tailored to local ecological, social, and political contexts. Her empirical findings reveal that hybrid arrangements, such as group-property regimes, often outperform both state-imposed or privatized systems when

participants are informed, empowered to craft their own rules, and motivated by long-term sustainability. Trust, reciprocity, monitoring, and sanctions underpin these cooperative systems (Ostrom 1990; Ostrom et al. 1999). Her analysis of locally managed irrigation systems in Nepal exemplifies how community-crafted rules combined with shared norms can outperform top-down governance even where technical capacity is limited (Ostrom et al. 1999).

These insights underscore that institutions are not static constructs but adaptive arrangements in response to shifting demands and governance challenges. Coase (1960) emphasizes that all institutional arrangements, whether market exchange, firm organization, or government regulation, carry inherent transaction and coordination costs, and that the appropriate arrangement depends on how effectively it minimizes these costs. Building on this, Williamson (2003) distinguishes between two forms of adaptation: autonomous adaptation, in which actors respond independently to external signals, and cooperative adaptation, which involves coordinated responses through shared rules, information exchange, and administrative mechanisms.[4] The former aligns with decentralized, price-driven systems, while the latter is associated with institutional structures that enable joint decision-making and conflict resolution (Williamson 2003). In settings marked by uncertainty, mutual dependency, or frequent interaction, cooperative adaptation becomes particularly important. From this perspective, institutional arrangements are selected and refined based on their capacity to facilitate coordination under real-world constraints. Medium institutionalization, situated between informal markets and hierarchical authority, thus provides a flexible yet structured mode of governance suited to such conditions.

Williamson (1991; 2003) complements this middle-ground perspective, arguing that as asset specificity, uncertainty, and transaction frequency increase, actors often adopt intermediate forms of coordination that are more complex than markets but less

[4] Williamson (2003) draws on Hayek's (1945) notion of autonomous adaptation, where market actors respond individually to price signals, and Barnard's (1938) idea of cooperative adaptation, which emphasizes deliberate, coordinated responses within hierarchical organization.

centralized than hierarchies.[5] These structures are particularly well-suited to settings where actors must maintain autonomy while engaging in durable, cooperative arrangements.

Thus, medium institutionalization balances autonomy with cooperation and is especially well-suited to contexts like transboundary environmental governance, where sovereignty concerns and resource complexity make rigid, top-down solutions impractical.

2.4. High Institutionalization: Integrated Institutional Structures

High institutionalization refers to centralized, formalized institutional arrangements with clearly defined rules, mandates, and enforcement mechanisms. These institutional arrangements are designed to manage complex, interdependent, and long-term transactions—situations where low or medium institutionalization proves inadequate.

Coase (1960) emphasizes that when transaction costs are high, low institutionalization, such as decentralized bargaining in market transactions, becomes inefficient. In such situations, alternative institutional arrangements are required to minimize the cost of negotiating, enforcing, and monitoring agreements. When neither market-based exchanges nor private bargaining suffices, coordination may shift to the firm-based organization or government regulation, both of which can internalize externalities and reduce transaction costs (Coase 1960).

Williamson (1991; 2003) extends this argument, noting that high institutionalization becomes necessary when transactions are characterized by high asset specificity, uncertainty, and frequency. Under these conditions, continuity becomes valuable, and efficient adaptation is encouraged. As bilateral dependency deepens, transactions shift from market-based coordination to hierarchical

[5] In transaction-cost economics, asset specificity refers to the difficulty of redeploying assets without loss of value (Williamson 1991). It becomes significant when specific relationships raise transaction costs. Along with high frequency and uncertainty, it increases contractual gaps and requires more structured governance (Williamson 1979).

structures, typically within firms or bureaucratic institutions, where centralized authority manages disputes and enforces compliance (Williamson 1991; 2003; 2008). The shift from market to hierarchy reflects a movement from autonomous contracting to unified ownership. While this mitigates opportunism, supports long-term cooperation, and internalizes dispute resolution, it introduces higher bureaucratic and administrative costs and limits flexibility (Williamson 1979; 2000; 2003). Williamson (2000; 2008) frames high institutionalization as a final institutional resort: actors typically attempt to manage transactions first through low institutionalization (market mechanisms), then medium institutionalization (hybrid structures), and only turn to hierarchy when these alternatives fail. While hierarchy introduces higher bureaucratic costs and reduces adaptability, it provides the strongest safeguards and dispute-resolution mechanisms. Thus, it becomes the preferred arrangement when tight coordination and institutional control are essential (Williamson 2000; 2008).

In this way, high institutionalization provides robust mechanisms for enforcement and coordination, especially when long-term cooperation is essential. Yet because these structures require significant organizational capacity and centralized authority, the applicability varies depending on regional governance norms and institutional maturity.

Ⅲ. ASEAN's Institutionalization Trajectory in Addressing Transboundary Haze Pollution: From Low to Medium Stages

The ASEAN region has pursued a gradual yet adaptive governance response to transboundary haze pollution, moving from low to higher degrees of institutionalization. Using the analytical framework of institutionalization, ASEAN's trajectory can be understood in terms of low and medium institutionalization, as previously defined in the literature review. This section traces key initiatives through this lens while also integrating analytical reflections previously addressed in the standalone mapping section.

3.1. Low Institutionalization: The 1995 ASEAN Cooperation Plan on Transboundary Pollution

The 1995 ASEAN Cooperation Plan represents a stage of low institutionalization characterized by ad hoc coordination, informal commitments, and minimal regional enforcement. Although transboundary haze had long been an environmental concern, regional attention intensified after the "Great Fire of Borneo" in 1982-83, which affected 3.2 million hectares of land and drew international scrutiny (Dennis 1999: 5-6, 19). Indonesia created a fire mitigation task force in 1985 and launched the Integrated Forest Fire Management Program in 1992, while other countries, such as Singapore, adopted individual measures like the Pollutant Standards Index (PSI), but these efforts remained uncoordinated and nationally confined (Goldammer 2017; Tan 19/10/2016).

Regional cooperation began to take shape only after the haze crisis of 1994, which prompted ASEAN to acknowledge the need for collective action. This led to the 1995 ASEAN Cooperation Plan on Transboundary Pollution, which aimed to promote zero-burning practices, early warning systems, and regional information sharing (Aggarwal and Chow 2010; ASEAN Secretariat 1995; Nguitragool 2011a). However, ASEAN's core principle of non-interference and the Plan's non-binding nature severely limited its enforceability (Aggarwal and Chow 2010; Kim and Lee 2016; Litta 2012). While the Haze Technical Task Force (HTTF) was formed to facilitate coordination among key member states such as Brunei, Indonesia, Malaysia, and Singapore, it lacked enforcement mechanisms and operational capacity. Cooperation remained largely bilateral, especially between Indonesia and Malaysia or Singapore (Litta 2012; Tay 1998). Crucially, the Plan included no institutional safeguards, such as reporting requirements, timelines, or formal monitoring mechanisms, that would support accountability or structured follow-up. Its language remained general, with objectives and activities left to the discretion of member states. This lack of constraint or procedural clarity highlights the characteristics of low institutionalization, where cooperative arrangements are minimal and institutional development remains shallow.

This stage of low institutionalization is defined by the absence of durable rules, enforcement mechanisms, or shared commitments. Countries relied on ad hoc responses and bilateral diplomacy, with little regional coherence. Although the Plan marked an initial recognition of transboundary haze as a shared issue, its absence of structured coordination or binding commitments meant that ASEAN remained unprepared for the crisis that would follow in 1997 (Aggarwal and Chow 2010; Tay 1998).

3.2. Medium Institutionalization: The 1997 Regional Haze Action Plan

The 1997 haze crisis, sparked by extensive fires in Indonesia, marked a pivotal turning point in ASEAN's environmental governance. The disaster severely impacted Malaysia and Singapore, disrupting public health, aviation, and tourism. Mounting criticism of Indonesia's weak enforcement capacity and links to commercial forestry, along with the pressures of the concurrent Asian financial crisis, compelled ASEAN to take more coordinated action (Aggarwal and Chow 2010; Dennis 1999).

This urgency led to the adoption of the Regional Haze Action Plan (RHAP) in December 1997 (Litta 2012), signaling ASEAN's move into a stage of medium institutionalization. Unlike the 1995 Cooperation Plan, the RHAP introduced clearer operational guidelines and institutional safeguards to strengthen compliance.[6] These included time-bound deadlines for national action plans, structured monitoring mechanisms, and coordination via national focal points and technical bodies. It also incorporated practical tools such as the Forest Fire Danger Rating system, measures aimed at reducing discretion and fostering regional coherence (Aggarwal and Chow 2010; ASEAN Secretariat 1997).

While these institutional features marked significant progress, the RHAP still reflected core features of the ASEAN Way, notably, informality, non-interference, and consensus-based decision-making. These principles limited enforceability but ensured wide

[6] These operational guidelines—prevention, mitigation, and monitoring—were led by the most affected states: Malaysia, Indonesia, and Singapore, respectively (Litta 2012).

participation at a time of political and economic volatility. The RAHP exemplified a loosely coupled institutional system, where national implementation varied and coordination relied more on shared norms and technical cooperation than binding obligations.

3.3. Medium Institutionalization: The 2002 ASEAN Agreement on Transboundary Haze Pollution

Despite the RHAP's shortcomings, the persistence of transboundary haze prompted ASEAN to adopt a more comprehensive and legally binding agreement in 2002, the ASEAN Agreement on Transboundary Haze Pollution (AATHP). The AATHP represents a significant step forward in ASEAN's governance of transboundary haze pollution. It was designed to provide a more institutional framework for preventing and monitoring haze through technical cooperation and collaboration at national, regional, and international levels (Aggarwal and Chow 2010; ASEAN Secretariat 2002).

Unlike earlier initiatives, the AATHP incorporated multiple institutional safeguards that elevated ASEAN's capacity for collection action. These include: (1) the designation of national focal points and competent authorities (Article 6); (2) obligations to establish national monitoring centers and share data on fire-prone areas and haze levels (Article 7-8); (3) mandatory development of preparedness and response strategies (Article 9-11); and (4) the establishment of the ASEAN Coordinating Centre for Transboundary Haze Pollution Control (ACC THPC), tasked with consolidating data, coordinating assistance, and maintain expert and equipment registries (Article 5 and Annex). The Agreement also established the ASEAN Transboundary Haze Pollution Control Fund to mobilize resources for joint haze mitigation activities (Article 20) (ASEAN Secretariat 2002). Together, these mechanisms constrain discretion, promote information sharing, and increase the cost of non-compliance, hallmarks of medium institutionalization.

However, despite its legally binding status, the AATHP continues to operate within the parameters of the ASEAN Way, which emphasizes state sovereignty and non-interference (Aggarwal

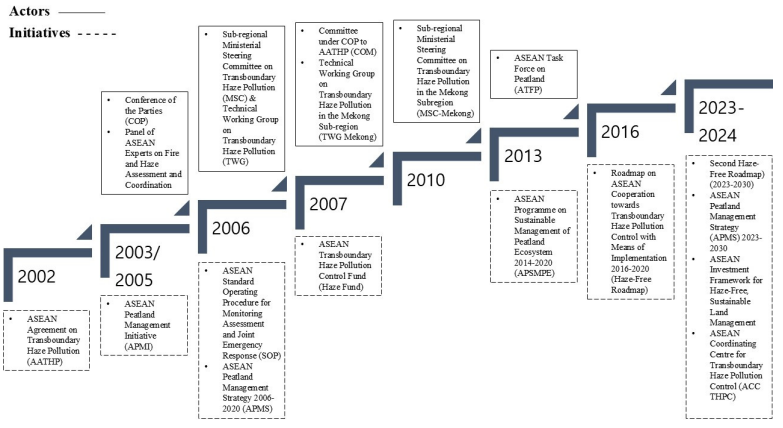
and Chow 2010; Charusombat 2022; Muhammad 2022). While these principles present challenges for implementation, particularly due to the absence of strict enforcement provisions and third-party involvement in dispute resolution mechanisms (Ling 2017; Muhammad 2022), ASEAN has continued to navigate these dilemmas. The delay in Indonesia's accession to the AATHP underscores the difficulties of balancing national sovereignty with regional cooperation (Abbott and Snidal 2000; Muhammad 2022). Nonetheless, ASEAN's continued reliance on diplomatic negotiation and voluntary compliance reflects an ongoing effort to reconcile diverse national interests with the collective need for regional governance. This flexibility, although it limits enforceability, has enabled the region to adapt to the complexities of transboundary haze pollution while preserving political cohesion. The AATHP thus exemplifies ASEAN's attempt to scale up institutionalization without abandoning its foundational norms, highlighting both the potential and the constraints of medium institutionalization in a sovereignty-sensitive regional context.

3.4. Medium Institutionalization: Implementation under the AATHP

Since the adoption of the AATHP, ASEAN has facilitated regional negotiations, secured ratification by all member states, and guided the development of various initiatives (see Figure 1). The post-2002 implementation phase of the AATHP reflects a deepening of medium institutionalization through the development of formal structures, regional coordination mechanisms, and technical safeguards.

Following its signing in 2002 and enforcement in 2003, the Conference of the Parties (COP) was established to oversee implementation (ASEAN Secretariat 2014; 2023a; Charusombat 2022). The ASEAN Peatland Management Initiative (APMI) was also launched in 2003 to address peatland degradation, a major contributor to haze, by promoting sustainable practices and reducing fire risks (ASEAN Secretariat 2014; Varkkey et al. 2024). In 2005, the Panel of ASEAN Experts on Fire and Haze Assessment and

<Figure 1> Key Developments Since the 2002 ASEAN Agreement on Transboundary Haze Pollution



Note. Created based on ASEAN Secretariat 2023a; 2023b; Charusombat 2022: 6-7; 2025: 3; Varkkey et al. 2024: 24. This figure synthesizes information from these sources and is the authors' creation.

Coordination was formed, comprising 29 experts across academia, industry, and NGOs, to develop operational procedures for haze mitigation (ASEAN Secretariat 2021; Charusombat 2022).

In 2006, ASEAN introduced several institutional mechanisms to strengthen haze mitigation efforts. The ASEAN Peatland Management Strategy (APMS) 2006-2020 was developed under the APMI and AATHP framework and later revised in 2013. In that same year, the Standard Operating Procedure (SOP) for fire prevention and control was introduced. Additionally, the Sub-Regional Ministerial Steering Committee (MSC) on Transboundary Haze Pollution was established, with Brunei Darussalam, Indonesia, Malaysia, Singapore, and Thailand overseeing implementation efforts, supported by the Technical Working Group (TWG) (ASEAN Secretariat 2014).

A key milestone was reached in 2007 when COP-2 approved financial rules for the ASEAN Transboundary Haze Pollution Control Fund, setting a target of US$500,000 to support the AATHP's implementation (ASEAN Secretariat 2002; 2021). Further institutional developments followed, including the establishment of the

Committee (COM) under the COP and the Technical Working Group on Transboundary Haze Pollution in the Mekong Sub-Region (TWG Mekong). The latter supports the MSC-Mekong, which was formalized at COP-6 in 2010 to enhance cooperation among Cambodia, Lao PDR, Myanmar, Thailand, and Viet Nam in haze control. In 2013, the ASEAN Task Force on Peatland (ATFP) was established under the COM to guide the implementation of the APMS and the ASEAN Programme on Sustainable Management of Peatland Ecosystems (APSMPE) 2014-2020 (ASEAN Secretariat 2021).

Indonesia's delayed ratification of the AATHP, which occurred in 2014 with the submission of ratification instruments in 2015, was a significant development. As the primary source of transboundary haze, Indonesia's commitment revitalized ASEAN's haze mitigation efforts (Charusombat 2022). This momentum led to the adoption of the Haze-Free Roadmap 2016-2020 at COP-12 in 2016, developed by a Task Force comprising senior officials and experts from member states. The Roadmap outlined four key components: a vision, an overarching goal with indicators, core strategies, and implementation timelines. A major component of the plan was the establishment of the ACC THPC, set for 2016, with full operationalization targeted for 2018 (ASEAN Secretariat 2021; 2022).

The ACC THPC was envisioned as the central coordinating body for haze mitigation, facilitating expert coordination, resource management, and best practice dissemination (ASEAN Secretariat 2002). However, its establishment faced delays, primarily due to Indonesia's initial refusal to ratify the AATHP. Since the Centre was to be located in Riau, Sumatra, a haze-prone region, Indonesia was granted significant operational influence, including expert selection. The delay in ratification postponed the Centre's launch, leaving haze-related coordination to the ASEAN Secretariat, which lacked dedicated resources for comprehensive implementation (Varkkey 2014). Funding shortages further may have further hindered progress (Nguitragool 2011b). By 2015, the ASEAN Transboundary Haze Pollution Fund had accumulated only US$350,000 of the targeted US$500,000, limiting its capacity for large-scale projects (Sunchindah 2015). Recognizing this gap, ASEAN adopted the Second ASEAN Haze-Free Roadmap (2023-2030) in 2023, with improved funding

strategies (ASEAN Secretariat 2024c).

Efforts to enhance financial sustainability include the ASEAN Investment Framework for Haze-Free Sustainable Land Management (AIF-HFSLM), introduced to mobilize approximately US$1.5 billion by 2030 (ASEAN Secretariat 2024b). This framework supports haze mitigation by addressing root causes such as unsustainable land management and deforestation. Developed in collaboration with the International Fund for Agricultural Development (IFAD) and the Global Environment Centre (GEC) under the Measurable Action for Haze-Free Sustainable Land Management in Southeast Asia (MAHFSA) Programme, the AIF-HFSLM aims to scale up biodiversity and carbon financing to support peatland restoration and sustainable agricultural practices (ASEAN Secretariat 2024a; Charusombat 2025; Varkkey et al. 2024).

Further institutional and financial advancements were made in 2023-2024. The APMS 2023-2030 was developed as a continuation of its predecessor, incorporating climate change mitigation, biodiversity conservation, and sustainable land use while encouraging member states to align their National Action Plans for Peatlands (NAPPs) with the broader APMS (ASEAN Secretariat 2023a). At COP-18 in August 2023, ASEAN adopted the Second ASEAN Haze-Free Roadmap (2023-2030), integrating science-based, multi-disciplinary approaches to haze mitigation. This second Roadmap strengthens ASEAN's policy instruments and stakeholder engagement, reinforcing regional cooperation (ASEAN Secretariat 2024c).

Private sector engagement has become increasingly critical for securing long-term funding. Carbon markets are emerging as a key mechanism for supporting peatland restoration, linking economic incentives with environmental sustainability. ASEAN has also sought financial support from institutions such as the Global Environmental Facility (GEF) and the Global Climate Fund (GCF) to sustain haze mitigation projects. Additionally, alternative financing mechanisms, including green bonds and circular economy incentives, are being explored to promote sustainable land use.[7] Annual donor forums

[7] Green bonds are financial instruments for funding environmentally sustainable projects, such as sustainable land management. Circular economy incentives

and partnership conferences now play a vital role in resource mobilization, particularly within sectors like land management, finance, and commodities (ASEAN 2024a; 2024b).

Despite progress, the full operationalization of the ACC THPC remains stalled. Although the Centre was soft-launched at the 43rd ASEAN Summit in 2023 by then ASEAN Chair and Indonesian President Joko Widodo, formal establishment has been delayed due to the reluctance of Thailand, Viet Nam, and the Philippines to sign the establishment agreement (Antara 14/02/2024). Their hesitation may stem from concerns similar to those that previously delayed Indonesia's ratification, national interests, domestic priorities, and ASEAN's principles of non-interference and sovereignty (May and Masri 2019; Nguitragool 2011a; Song 2023; Varkkey 2018). Geographical factors also influence this reluctance, as these countries are less affected by haze compared to Indonesia, Malaysia, and Singapore, which bear the brunt of transboundary pollution (Nguitragool 2011a; Varkkey 2018).

This implementation phase consolidates ASEAN's medium-institutionalized governance model, one that relies on a combination of structure procedures and flexible cooperation. Although delays in regional cooperation persist, ASEAN remains committed to addressing transboundary haze pollution. Institutional advancements and financial mechanisms continue to advance, reflecting ASEAN's ongoing efforts to strengthen environmental governance. The second Roadmap (2023-2030) and AIF-HFSLM represent critical steps toward securing sustainable funding and enhancing regional coordination. The growing emphasis on multi-stakeholder partnerships, inter-ministerial cooperation, and innovative financing mechanisms signals ASEAN's determination to tackle haze pollution while respecting its foundational principles of consensus and sovereignty. These developments reflect ASEAN's pursuit of a flexible and multi-layered governance model that balances sovereignty with regional cooperation. While the institutional depth has increased through structured initiatives and

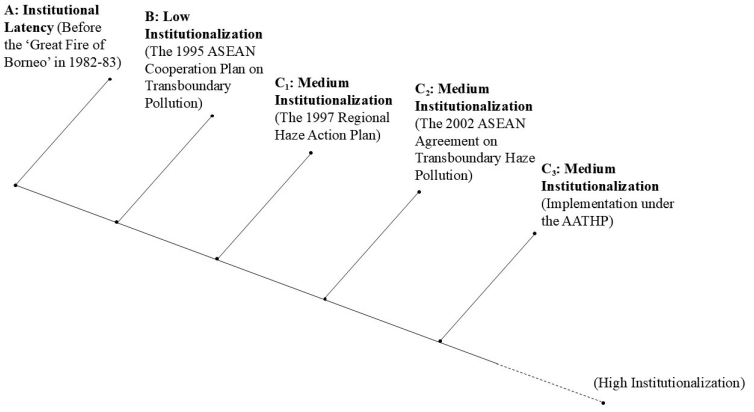
encourage the reuse of agricultural waste and promote sustainable practices like fire prevention and land rehabilitation to address haze root causes (ASEAN Secretariat 2024a).

funding mechanisms, the absence of hierarchical enforcement keeps ASEAN's model within the bounds of medium institutionalization.

3.5. Mapping ASEAN's Institutionalization Trajectory for Haze Governance

In analyzing ASEAN's governance structure for transboundary haze pollution, Williamson's simple contractual schema provides a useful framework. The model delineates three governance modes: simple market, hybrid, and hierarchy. Williamson (1991; 2000; 2003; 2008) explains that governance structures develop from simple to complex contracting based on transaction attributes such as asset specificity, uncertainty, and frequency. These transaction attributes play a crucial role in determining the contextually appropriate governance structure for addressing transboundary haze pollution. The region's geographical proximity creates strong interdependencies between upstream and downstream countries, exemplifying site-specific asset specificity, as seen in the severe economic and health impacts of Indonesian forest fires on Malaysia and Singapore (Kim and Lee 2016; Mai 2023; Varkkey 2018). The increasing frequency of major haze events, occurring almost annually in some decades, further underscores the need for structured governance (SIIA 2022; 2024). Recurrent crises make ad-hoc responses unsustainable, raising transaction costs and necessitating institutionalized cooperation (Kim and Lee 2016; Williamson 1979). Meanwhile, uncertainty, stemming from asymmetric information, fluctuating meteorological conditions, and inconsistent data-sharing, complicates coordination efforts and increases transaction costs (Keohane 1982; Kim and Lee 2016). The reluctance to disclose critical information exacerbates trust issues, making cooperative adaptation essential (Kim and Lee 2016). As these factors intensify, ASEAN's institutional arrangements have shifted from low to more structured, medium-level configurations that balance flexibility with cooperation. To more precisely map this trajectory, this paper adopts the terms low and medium institutionalization to describe ASEAN's institutional development (see Figure 2). ASEAN's adapting approach to transboundary haze governance reflects a progression through stages of institutionalization, shaped by these changing transaction attributes and regional dynamics.

<Figure 2> ASEAN's Adaptive Institutionalization for Transboundary Haze Pollution



Note. Adapted from Williamson 2008: 11. Permission granted by *The Korean Association of Small Business Studies*. The dotted outline for "High Institutionalization" represents a theoretical trajectory toward hierarchical governance—a stage that has not materialized in ASEAN's approach to haze governance.

Initially, at Node A, before the "Great Fire of Borneo" in 1982-83, the region lacked formal governance mechanisms. Transboundary haze was treated primarily as a domestic issue, and regional responses were minimal (Dennis 1999: 5-6). This absence of institutional coordination exemplifies a phase of institutional latency, in which existing norms and non-decisions produced effects equivalent to passive policy choices. As Coase (1960) notes, legal arrangements, including the choice not to regulate, inevitably influence outcomes, meaning that institutional inaction itself constitutes a form of governance.

At Node B, the 1995 ASEAN Cooperation Plan on Transboundary Pollution marked the first step toward low institutionalization. The Plan encouraged cooperation but lacked binding commitments, monitoring systems, or enforcement provisions. It reflected fragmented, ad hoc coordination where discretion was high and safeguards were minimal (Aggarwal and Chow 2010; Nguitragool 2011a). As transaction frequency increased and asset specificity became more pronounced, particularly between

upstream (Indonesia) and downstream (Malaysia and Singapore) states, the need for more structured governance emerged.

At Node C_1, the 1997 Regional Haze Action Plan introduced more robust institutional safeguards, including time-bound deadlines, national action plans, and regional coordination mechanisms (Aggarwal and Chow 2010; Nguitragool 2011a). This shift signaled ASEAN's entry into medium institutionalization, aligning with Williamson's hybrid governance model, where formal structures balance flexibility and cooperation. Although enforcement remained weak, structured coordination was enhanced through technical tools.

At Node C_2, the 2002 ASEAN Agreement of Transboundary Haze Pollution further formalized ASEAN's governance approach. The Agreement introduced legally binding commitments, regional reporting duties, and institutional bodies such as the COP. While these mechanisms deepened cooperation, their implementation was constrained by ASEAN's principles of consensus and non-interference. As a result, ASEAN maintained a medium-institutionalized model, with expanded safeguards but no centralized enforcement authority.

At Node C_3, the implementation phase under the AATHP saw the proliferation of regional strategies, financial frameworks, and expert networks. Initiatives like the Haze-Free Roadmaps and the AIF-HFSLM further institutionalized coordination, while continuing to prioritize flexibility and national sovereignty. The soft launch of the ACC THPC in 2023, despite incomplete ratification, illustrates the limits of institutional deepening under political constraints.

This trajectory reflects ASEAN's distinctive institutional logic, an adaptive model that privileges consensus, flexibility, and national sovereignty. Although often viewed as a constraint, the ASEAN Way also functions as a pragmatic response to regional political realities. As the preceding analysis shows, regional cooperation has taken shape through interaction with concrete political and institutional contexts, rather than in a vacuum. The variation in national-level authority structures, economic interests, and political incentives has shaped how individual states engage with ASEAN's haze governance

efforts. Rather than enforcing uniform compliance, ASEAN's hybrid mechanisms accommodate this diversity by enabling differentiated participation and incremental commitment. This governance model, while imperfect, has institutionalized cooperation through arrangements that are politically viable, context-sensitive, and capable of gradual strengthening. A more extensive assessment of whether the ASEAN Way serves as a stepping stone or a stumbling block in ASEAN's institutional development will be addressed in the Discussion section.

Ⅳ. Discussion and Implications

ASEAN's haze governance offers a compelling case of medium institutionalization shaped by hybrid and adaptive approaches. Throughout this paper, ASEAN's trajectory has been analyzed through an integrative framework that bridges transaction-cost economics and institutional theory across both micro- and macro-levels, combining insights from Coase and Williamson with regime theory and commons governance perspectives articulated by Keohane and Ostrom. This framework traces ASEAN's movement from institutional latency to low and medium institutionalization. At each point, ASEAN responded incrementally to changing transaction attributes: rising asset specificity due to geographic proximity, increasing uncertainty due to asymmetrical information and environmental volatility, and heightened frequency of transboundary haze events. These attributes collectively increased the costs of uncoordinated action, prompting more structured yet flexible institutional arrangements.

This institutional responsiveness becomes clearer when viewed through the lens of domestic political variation across ASEAN member states. Regional cooperation has not advanced uniformly because national-level constraints and incentives vary widely. In Indonesia, for instance, political authority over land and environmental management is dispersed across national and local levels. This fragmented structure, combined with the economic importance of resource-based industries such as palm oil,

complicates the country's ability to implement regional commitments. Local political interests often prioritize short-term economic gains over environmental safeguards, making cohesive policy enforcement difficult and cooperation politically costly. These conditions have contributed to Indonesia's slow and selective engagement with ASEAN haze governance, even after formal ratification of the AATHP in 2014 (Dannhauer 2024; Hurley and Lee 2021; Varkkey 2012; 2014; 2018). In contrast, Singapore has responded to transboundary haze challenges with more assertive legal and policy instruments. Following the severe 2013 haze crisis, the government enacted the Transboundary Haze Pollution Act (THPA) in 2014, asserting jurisdiction over foreign entities whose activities cause haze in Singapore. This move reflected not only legal innovation but also domestic political pressures: the crisis triggered widespread public discontent and mobilized civil society organizations demanding stronger state action (Song 2023; Varkkey 2018). Malaysia, by comparison, has adopted a more cautious posture. Although repeatedly affected by haze episodes, its government has avoided legal confrontation, partly due to economic entanglements in Indonesia's plantation sector, and has instead emphasized technical cooperation and quiet diplomacy (Forsyth 2014; Varkkey 2012; 2018). These divergent approaches illustrate how ASEAN's flexible institutional design accommodates national variation. By enabling differentiated participation rather than requiring uniform compliance, ASEAN lowers the political costs of cooperation for its member states. What appears as institutionally weak may in fact be a calibrated adaptation to the domestic political constraints of a diverse region. In this sense, ASEAN's medium institutionalization reflects not a failure of integration, but a deliberate balance between sovereignty and collective action.

This analysis also reveals how the ASEAN Way functions not only as a constraint but also as an enabling condition for institutional development. ASEAN's emphasis on consensus, non-interference, and informality has traditionally been critiqued for impeding enforcement and delaying action. However, when viewed through the lens of transaction-cost economics and institutional diversity, these norms appear as strategic adaptations. As North

(2003) emphasizes, institutional development is historically contingent and path-dependent, shaped by inherited belief systems and regional experiences. In ASEAN's case, these cultural and political norms influence a governance model that privileges consensus and autonomy over legalism and enforcement. In a politically diverse and sovereignty-conscious region, rigid hierarchical solutions would be infeasible. ASEAN's hybrid model instead fosters trust, preserves autonomy, and builds capacity gradually, allowing participation without imposing a single institutional model.

Each institutional stage examined in this paper reflects a contextually appropriate solution, given prevailing political constraints. The 1995 Cooperation Plan, although weakly institutionalized, marked an important starting point by signaling regional acknowledgment of haze as a shared problem. The 1997 RHAP introduced structured safeguards while retaining voluntary participation. The 2002 AATHP, despite being legally binding, maintained flexibility in implementation, reflecting member states' reluctance to concede authority. Even the delayed implementation of the ACC THPC underscores how ASEAN incrementally balances collective needs with individual sovereignty.

Considering these developments together, they illustrate a model of adaptive institutionalization grounded in both economic and political logic. ASEAN's governance system, while avoiding hierarchical enforcement, has constructed a loosely coupled yet resilient institutional framework. This design echoes Keohane and Victor's concept of loosely coupled systems and Ostrom's principle of institutional diversity, both of which emphasize flexible, layered cooperation across diverse actors. The increasing involvement of NGOs, technical bodies, private actors, and international organizations reinforces this pluralistic character, allowing cooperation to deepen over time without centralized control. Meanwhile, the adaptive nature of ASEAN's institutional responses corresponds with Keohane's theory of regime demand, showing how institutions emerge and adapt in response to transaction costs, interdependence, and political constraints.

The implications of this model extend beyond haze governance. ASEAN's hybrid institutional arrangements may offer responses to other regionally shared environmental challenges, particularly those requiring coordination across diverse political systems and where centralized authority is infeasible. Rather than assuming that more formal or hierarchical solutions are inherently superior, this case illustrates how medium institutionalization, structured but flexible, can offer a durable, politically viable alternative. Especially in sovereignty-sensitive settings with fragmented authority, such adaptive institutional designs may strike the right balance between cooperation and autonomy.

Ⅴ. Conclusion

This study analyzes ASEAN's institutional response to transboundary haze pollution by tracing its shift from fragmented arrangements to more structured, politically viable forms of cooperation. Through four key stages—the 1995 ASEAN Cooperation Plan, the 1997 Regional Haze Action Plan, the 2002 ASEAN Agreement on Transboundary Haze Pollution, and its subsequent implementation—ASEAN demonstrates an incremental trajectory from low to medium institutionalization. Instead of adopting hierarchical enforcement, the region has pursued a hybrid model that balances institutional design with political sensitivity. By maintaining flexible institutional norms, rooted in consensus, non-interference, and informality, while gradually embedding safeguards, ASEAN has built a governance system capable of sustaining transboundary cooperation amid political diversity.

These findings contribute to regional governance scholarship by illustrating how medium institutionalization, when aligned with sovereignty concerns, interdependence, and political feasibility, can offer a durable alternative to more rigid governance models. This study's integrated analytical framework, drawing from transaction cost economics, regime theory, and commons governance, offers a novel perspective on how regional cooperation can be institutionalized under real-world constraints. Such insights are

particularly relevant for other sovereignty-sensitive contexts where formal legalization is politically constrained.

The analysis also underscores the importance of domestic political dynamics in shaping engagement with regional frameworks. Illustrative cases, such as Indonesia's decentralized land governance or Singapore's legal innovation, show that national institutional variation among member states influences implementation. ASEAN's flexible design appears calibrated to accommodate this diversity, rather than enforcing uniformity. Future research could build on this by comparing domestic-regional linkages across policy areas or tracing how internal political change affects institutional commitment.

Ultimately, ASEAN's experience shows that institutionalization does not need to follow a linear path toward high institutionalization. In regions marked by political heterogeneity and legal asymmetry, adaptive, medium-level institutionalization may be not only viable but preferrable. For policymakers, the ASEAN case emphasizes the value of flexible, context-sensitive design. For scholars, it offers an opportunity to rethink institutional success in terms of adaptation and political fit, rather than institutional rigidity alone.

References

Abbott, Kenneth W. and Duncan Snidal. 2000. Hard and Soft Law in International Governance. *International Organization* 54 (3): 421-456.

Acharya, Amitav. 2001. *Constructing a Security Community in Southeast Asia: ASEAN and the Problem of Regional Order*. London and New York: Routledge. https://fmc90.wordpress.com/wp-content/uploads/2010/05/constructing-a-security-in-asean.pdf (Accessed May 18, 2024).

Acharya, Amitav. 2017. The Evolution and Limitation of ASEAN Identity. *Building ASEAN Community: Political-Security and Socio-cultural Reflections*. Aileen Baviera and Larry Maramis, eds. 25-38. Jakarta: Economic Research Institute for ASEAN and East Asia

(ERIA). https://www.eria.org/research/asean-50-volume-4-building-asean-community-political-security-and-socio-cultural-reflections/# (Accessed May 18, 2024).

Aggarwal, Vinod K., and Jonathan T. Chow. 2010. The Perils of Consensus: How ASEAN's Meta-Regime Undermines Economic and Environmental Cooperation. *Review of International Political Economy* 17 (2): 262-290.

Alam, Shawkat, and Laely Nurhidayah. 2017. The International Law on Transboundary Haze Pollution: What Can We Learn from the Southeast Asia Region? *Review of European, Comparative and International Environmental Law* 26 (3): 243-254.

Antara. 2024. RI Pursuing Transboundary Haze Control Center Plan. *Antara News*, February 14. https://en.antaranews.com/news/339070/ri-pursuing-transboundary-haze-control-center-plan (Accessed March 2025).

ASEAN Secretariat. 1995. ASEAN Co-operation Plan on Transboundary Pollution. *ASEAN Economic Bulletin* 12 (1): 89-95. https://www.jstor.org/stable/25770582 (Accessed April 3, 2025).

ASEAN Secretariat. 1997. *1997 Regional Haze Action Plan*. https://cil.nus.edu.sg/databasecil/1997-regional-haze-action-plan-3/ (Accessed April 23, 2025).

ASEAN Secretariat. 2002. *ASEAN Agreement on Transboundary Haze Pollution*. https://asean.org/wp-content/uploads/2021/01/ASEANAgreementonTransboundaryHazePollution-1.pdf (Accessed March 5, 2025).

ASEAN Secretariat. 2014. *ASEAN Peatland Management Strategy 2006-2020*. Jakarta: ASEAN Secretariat. https://asean.org/book/asean-peatland-management-strategy-2006-2020-updated-september-2013/ (Accessed March 3, 2025).

ASEAN Secretariat. 2021. *Roadmap on ASEAN Cooperation towards Transboundary Haze Pollution Control with Means of Implementation.* Jakarta: ASEAN Secretariat. https://asean.org/book/roadmap-on-asean-cooperation-towards-transboundary-haze-pollution-control-with-means-of-implementation-3/ (Accessed March 3, 2025).

ASEAN Secretariat. 2022. *Executive Summary of the Final Review of*

the Roadmap on ASEAN Cooperation towards Transboundary Haze Pollution Control with Means of Implementation. Jakarta: ASEAN Secretariat. https://asean.org/wp-content/uploads/2022/06/Executive-Summary-Haze-Roadmap-Review-E-PUB-21Jun22.pdf (Accessed July 5, 2023).

ASEAN Secretariat. 2023a. *ASEAN Peatland Management Strategy 2023-2030*. Jakarta: ASEAN Secretariat. https://asean.org/book/strategy-and-action-plan-for-sustainable-management-of-peatlands-in-asean-member-states-2023-2030/ (Accessed March 5, 2025).

ASEAN Secretariat. 2023b. *Secretary-General of ASEAN Witnesses Soft Launching of ASEAN Coordinating Centre for Transboundary Haze Pollution Control*. ASEAN.org. September 5. https://asean.org/secretary-general-of-asean-witnesses-soft-launching-of-asean-coordinating-centre-for-transboundary-haze-pollution-control/ (Accessed March 2025).

ASEAN Secretariat. 2024a. *ASEAN Investment Framework for Haze-Free Sustainable Land Management*. Jakarta: ASEAN Secretariat. https://asean.org/book/asean-investment-framework-for-haze-free-sustainable-land-management/ (Accessed March 5, 2025).

ASEAN Secretariat. 2024b. *ASEAN Reaffirms Commitment to Tackle Transboundary Haze with Financial Framework*. ASEAN.org. September 13. https://hazeportal.asean.org/2024/09/13/asean-reaffirms-commitment-to-tackle-transboundary-haze-with-financial-framework/ (Accessed March 5, 2025).

ASEAN Secretariat. 2024c. *The Second Roadmap for ASEAN Cooperation on Transboundary Haze Pollution Control with Means of Implementation*. Jakarta: ASEAN Secretariat. https://asean.org/book/the-second-roadmap-for-asean-cooperation-on-transboundary-haze-pollution-control-with-means-of-implementation/ (Accessed March 5, 2025).

Barnard, Chester I. 1938. *The Functions of the Executive*. Cambridge, MA: Harvard University Press. https://dn790003.ca.archive.org/0/items/in.ernet.dli.2015.190485/2015.190485.The-Functions-Of-The-Executive.pdf (Accessed May 18, 2024).

Byrne, Adam. 2015. The 1979 Convention on Long-Range Transboundary Air Pollution: Assessing Its Effectiveness as a Multilateral Environmental Regime after 35 Years.

Transnational Environmental Law 4 (1): 37-67.

Caballero-Anthony, Mely. 2017. From Comprehensive Security to Regional resilience: Coping with Nontraditional Security Challenges. *Building ASEAN Community: Political-Security and Socio-cultural Reflections*. Aileen Baviera and Larry Maramis, eds. 123-145. Jakarta: Economic Research Institute for ASEAN and East Asia (ERIA). https://www.eria.org/research/asean-50-volume-4-building-asean-community-political-security-and-socio-cultural-reflections/# (Accessed July 16, 2025).

Charusombat, Phurida. 2022. ASEAN Cooperation on Transboundary Haze Pollution: The Perspective of Institutional Incremental Change. *Journal of Environmental Information Science* 22 (2): 1-12.

Charusombat, Phurida. 2025. Enhancing Transboundary Haze Pollution Cooperation in Southeast Asia (2003-2020): External Actors and ASEAN Supporting Mechanisms. *Asia Social Issues* 18 (1): e270363.

Coase, R. H. 1960. The Problem of Social Cost. *Journal of Law and Economics* 3 (October): 1-44.

Dannhauer, Pia. 2024. Presidential Agency and Indonesia's Ratification of the ASEAN Agreement on Transboundary Haze Pollution. *Contemporary Southeast Asia* 46 (2): 243-270.

Dennis, Rona. 1999. *A Review of Fire Projects in Indonesia (1982-1998)*. Bogor: Center for International Forestry Research. https://www.cifor-icraf.org/publications/pdf_files/FireReport.pdf (Accessed July 5, 2023)

Forsyth, Tim. 2014. Public Concerns about Transboundary Haze: A Comparison of Indonesia, Singapore, and Malaysia. *Global Environmental Change* 25: 76-86.

Goldammer, Johann G. 2017. *Indonesia: Long-term National Integrated Forest Fire Management Programme Initiated at Bandung (IFFN No.8 – January 1993)*. Global Fire Monitoring Center. November 24. https://gfmc.online/iffn/country/id/id_1.html (Accessed October 7, 2024).

Gordon, H. Scott. 1954. The Economic Theory of a Common-Property Resource: The Fishery. *Journal of Political Economy* 62 (2): 124-142.

Hardin, Garrett. 1968. The Tragedy of the Commons. *American Association for the Advancement of Science* 162 (3859): 1243-1248.

Hayek, F.A. 1945. The Use of Knowledge in Society. *The American Economic Review* 35 (4): 519-530.

Heilmann, Daniel. 2015. After Indonesia's Ratification: The ASEAN Agreement on Transboundary Haze Pollution and Its Effectiveness as a Regional Environmental Governance Tool. *Journal of Current Southeast Asian Affairs* 34 (3): 95-121.

Hidayat, Herman. 2016. *Forest Resources Management in Indonesia (1968-2004): A Political Ecology Approach*. Springer: Singapore.

Hurley, Arran and Taedong Lee. 2021. Delayed Ratification in Environmental Regimes: Indonesia's Ratification of the ASEAN Agreement on Transboundary Haze Pollution. *The Pacific Review* 34 (6): 1108-1137.

Karpoff, Jonathan M. 2022. The Tragedy of "The Tragedy of the Commons": Hardin versus the Property Rights Theorists. *Journal of Law & Economics* 65 (S1): S65-S84.

Keohane, Robert O. 1982. The Demand for International Regimes. *International Organization* 36 (2): 325-355.

Keohane, Robert O. 1998. International Institutions: Can Interdependence Work? *Foreign Policy* (110): 82-96.

Keohane, Robert O. and Nye, Joseph S. Jr. 1998. Power and Interdependence in the Information Age. *Foreign Affairs* 77 (5): 81-94.

Keohane, Robert O. and Victor, David G. 2011. The Regime Complex for Climate Change. *Perspectives on Politics* 9 (1): 7-23.

Kim, Jin A and Jae-Woo Lee. 2016. A transaction cost approach to environmental cooperation: The case of haze pollution in Southeast Asia. *Journal of Economic Studies* 34 (1): 79-107.

Lee, Jae-Woo. 2010. Yellow Sand Storms and the Coase Theorem. *Journal of Economic Studies* 28 (3): 279-313.

Ling, Sarah Tan Yen. 2017. The ASEAN Agreement on Transboundary Haze Pollution: Exploring Mediation as Way Forward. *Asia Pacific Journal of Environment Law* 20 (1): 138-161.

Litta, Henriette. 2012. *Regimes in Southeast Asia: An Analysis of*

Environmental Cooperation. Wiesbaden, Germany: VS Verlag für Sozialwissenschaften.

Mai, L. 2023. *Extinguishing a point of contention: Examining transboundary haze in Southeast Asia*. Center for Strategic & International Studies, November 17. https://www.csis.org/blogs/new-perspectives-asia/extinguishing-point-contention-examining-transboundary-haze-southeast (Accessed January 26, 2024).

May, Lee Pei, and Mohd Shazani bin Masri. 2019. The Return of the Haze: An Analysis of Singapore Government's Behavior Before and After the 2013 Haze Attack. *Journal of Social Sciences Naresuan University* 13 (1): 225-235.

Muhammad, Fikri. 2022. Environmental Agreement under the Non-Interference Principle: The Case of ASEAN Agreement on Transboundary Haze Pollution. *International Environmental Agreements: Politics, Law and Economics* 22 (1): 139-155.

Munton, Don. 1997. Acid Rain and Transboundary Air Quality in Canadian-American Relations. *American Review of Canadian Studies* 27 (3): 327-58.

Nguitragool, Paruedee. 2011a. *Environmental Cooperation in Southeast Asia: ASEAN's Regime for Transboundary Haze Pollution*. Milton Park, Abingdon: Routledge.

Nguitragool, Paruedee. 2011b. Negotiating the Haze Treaty: Rationality and Institutions in the Negotiations for the ASEAN Agreement on Transboundary Haze Pollution (2002). *Asian Survey* 51 (2): 356-378.

North, Douglass C. 1991. Institutions. *The Journal of Economic Perspectives* 5 (1): 97-112.

North, Douglass C. 2003. *The Role of Institutions in Economic Development*. UNECE Discussion Paper Series, 2003 (2): 1-10.

Organisation for Economic Co-operation and Development (OECD). 2020. *Study of International Regulatory Co-operation (IRC) Arrangements for Air Quality: The Cases of the Convention on Long-Range Transboundary Air Pollution, the Canada-United States Air Quality Agreement, and Co-operation in North East Asia*. OECD Regulatory Policy Working Papers No. 12. Paris: OECD Publishing. https://www.oecd.org/content/dam/oecd/en/publications/reports/2020/01/study-of-international-regulator

y-co-operation-irc-arrangements-for-air-quality_6402d09f/dc34d5e3-en.pdf (Accessed July 5, 2023).

Ostrom, Elinor, Joanna Burger, Christopher B. Field, Richard B. Norgaard, and David Policansky. 1999. Revisiting the Commons: Local Lessons, Global Challenges. *Science* 284 (5412): 278-282.

Ostrom, Elinor. 1990. *Governing the Commons: The Evolution of Institutions for Collective Action*. Cambridge: Cambridge University Press.

Perrin, Sophie, and Thomas Bernauer. 2010. International Regime Formation Revisited: Explaining Ratification Behaviour with Respect to Long-Range Transboundary Air Pollution Agreements in Europe. *European Union Politics* 11 (3): 405-426.

Saikawa, Eri, Arnico Panday, Shichang Kang, Ritesh Gautam, Eric Zusman, Zhiyuan Cong, E. Somanathan and Bhupesh Adhikary. 2019. Air Pollution in the Hindu Kush Himalaya. *The Hindu Kush Himalaya Assessment: Mountains, Climate Change, Sustainability, and People*. Philippus Wester, Arabinda Mishra, Aditi Mukherji, and Arun Bhakta Shrestha, eds. 339-377. Cham, Switzerland: Springer Nature.

Scott, Anthony. 1955. The Fishery: The Objectives of Sole Ownership. *Journal of Political Economy* 63 (2): 116-124.

Singapore Institute of International Affairs (SIIA). 2022. *Haze Outlook 2022*. Singapore: Singapore Institute of International Affairs. https://www.siiaonline.org/report-haze-outlook-2022/ (Accessed June 21, 2023).

Singapore Institute of International Affairs (SIIA). 2024. *Haze Outlook 2024*. Singapore: Singapore Institute of International Affairs. https://www.siiaonline.org/haze-outlook-2024-report/ (Accessed September 28, 2024).

Song, Annie Young. 2023. Beyond Intergovernmental Cooperation: Domestic Politics of Transboundary Air Pollution in Korea and Singapore. *International Environmental Agreements: Politics, Law and Economics* 23 (4): 397-413.

Sunchindah, Apichai. 2015. *Transboundary Haze Pollution Problem in Southeast Asia: Reframing ASEAN's Response*. ERIA Discussion Paper Series No. 2015-82. Jakarta: Economic

Research Institute for ASEAN and East Asia (ERIA). https://www.eria.org/ERIA-DP-2015-82.pdf (Accessed March 6, 2025).

Tan, Audrey. 2016. 55 Years of Haze: How Plane Bound for KL Overflew to Singapore When It was All Hazy on Oct 19, 1961. *The Straits Times*, October 19. https://www.straitstimes.com/singapore/environment/55-years-of-haze-how-plane-bound-for-kl-overflew-to-singapore-when-it-was-all (Accessed May 20, 2024).

Tan, See Seng. 2017. Not Quite Beyond the 'ASEAN Way'? Southeast Asia's Evolution to Rules-based Management of Intra-ASEAN Differences. *Building ASEAN Community: Political-Security and Socio-cultural Reflections*. Aileen Baviera and Larry Maramis, eds. 67-87. Jakarta: Economic Research Institute for ASEAN and East Asia (ERIA). https://www.eria.org/research/asean-50-volume-4-building-asean-community-political-security-and-socio-cultural-reflections/# (Accessed May 20, 2024).

Tay, Simon S. C. 1998. South East Asian Forest Fires: Haze over ASEAN and International Environmental Law. *Review of European Community & International Environmental Law* 7 (2): 202-208.

Varkkey, Helena. 2012. Patronage Politics as A Driver of Economic Regionalisation: The Indonesian Oil Palm Sector and Transboundary Haze. *Asia Pacific Viewpoint* 53 (3): 314-329.

Varkkey, Helena. 2014. Regional Cooperation, Patronage and the ASEAN Agreement on Transboundary Haze Pollution. *International Environmental Agreements: Politics, Law and Economics* 14 (1): 65-81.

Varkkey, Helena. 2018. The Singapore Transboundary Haze Pollution Bill in the Context of ASEAN Regionalism and Cooperation. *Indonesian Journal of International Law* 15 (4): 553-579.

Varkkey, Helena. 2020. The ASEAN Way and Haze Mitigation Efforts. *Indonesian Journal of International Studies* 8: 77-97.

Varkkey, Helena, Matthew Ashfold, Gusti Z. Anshari, Alex M. Lechner, Sharon Seah, Nuirisa Wijayanti, Fatima Tuzzahara Alkaf, and Siti Asdiah Masran. 2024. *Mitigating Carbon Emissions and Haze in Southeast Asia's Peatlands:*

Opportunities and Challenges in Integrating Policy and Governance. Trends in Southeast Asia TRS 21/24. Singapore: ISEAS – Yusof Ishak Institute.

Williamson, Oliver E. 1979. Transaction-Cost Economics: The Governance of Contractual Relations. *Journal of Law and Economics* 22 (2): 233-261.

Williamson, Oliver E. 1991. Comparative Economic Organization: The Analysis of Discrete Structural Alternatives. *Sage Publications, Inc*. 36 (2): 269-296.

Williamson, Oliver E. 2000. The New Institutional Economics: Taking Stock, Looking Ahead. *Journal of Economic Literature*. 38 (3): 595-613.

Williamson, Oliver E. 2003. Examining Economic Organization through the Lens of Contract. *Industrial and Corporate Change* 12 (4): 917-942.

Williamson, Oliver E. 2008. Interfirm Contracting: Key Concepts and Lessons for Economic Organization. *The Korean Association of Small Business Studies* 30 (1): 1-14.

World Bank. 2019. *Indonesia Economic Quarterly: Investing in People*. Washington, DC: World Bank. https://openknowledge.worldbank.org/server/api/core/bitstreams/50986114-5ac6-5474-a303-623bc0175438/content (Accessed October 2024).

Zhang, J.J., and Victor R. Savage. 2019. Southeast Asia's Transboundary Haze Pollution: Unravelling the Inconvenient Truth. *Asia Pacific Viewpoint* 60 (3): 355-369.

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