

Emergent geographies of chronic air pollution governance in Southeast Asia: Transboundary publics in Singapore

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1 | INTRODUCTION

Countries in Southeast Asia have been experiencing land and forest fires during the dry season on an almost annual basis for decades. While 2019 was the most recent severe episode, 2015 saw the worst transboundary haze in Southeast Asia this century. Under certain regional climatic and weather conditions, the smoke from these fires travels across state boundaries and becomes a regional air pollution event known locally as transboundary 'haze' (Jones, 2004; Latif et al., 2018; Nguitragool, 2010; Varkkey, 2016). The biomass origins of these fires mean that they are extremely hazardous to health. The tiny particles, as small as 2.5 μm (PM or 'particulate matter' 2.5), can be easily inhaled

Abstract

Haze is a product of in-situ biomass fires that becomes mobile as it moves across state boundaries in Southeast Asia. The literature on the governance of transboundary air commons has largely been fixed at the national or supranational scalar of reference. Hence, successes and failures tend to be evaluated based on policy and diplomatic (non)progress. This paper contributes to recent literature that argues that haze should be treated as a challenge and opportunity for transboundary governance and not merely transnational governance. Transboundary governance does not restrict the study of cross-border relations to national scales of analysis but encompasses resource connections that traverse borders at all scales of governance. This paper focuses on Singapore, a state where biomass fires do not occur but where the effects of haze are acutely felt. Among ASEAN member states, Singapore has been viewed as a particularly active player in region-wide governance on haze. However, the role of non-state environmental stewardship initiatives in pathfinding, nudging, and signalling state, corporate and regional actors towards emergent transboundary governance arrangements have been underplayed. By focusing on the efforts of the Singapore Institute of International Affairs (SIIA), Singapore Environment Council (SEC), and People's Movement to Stop Haze (PM Haze), this paper explores how transboundary publics can fill policy gaps in transnational haze governance regimes. As a highly depoliticised city-state, Singapore's experience serves as a microcosm for ways forward within the broader ASEAN geopolitical culture favouring depoliticised 'engaged non-indifference'.

KEYWORDS

air pollution, environmental governance, Singapore, transboundary publics

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and enter one's bloodstream, causing serious respiratory and cardiovascular conditions. Studies have estimated that between 40,000 (Kiely et al., 2020) and 100,000 (Koplitiz et al., 2016) additional deaths in Southeast Asia due to the 2015 haze episode.

The haze also wreaks havoc on regional economies, livelihoods and social lives. Schools are closed, and outdoor activities cease. Individual households rack up additional medical costs in the form of masks, medications, air purifiers and clinic or hospital visits. Tourists avoid affected countries, and aeroplanes are grounded due to poor visibility. Business

productivity drops as employees become sick or when working conditions become untenable. National budgets are diverted to firefighting, cloud seeding, and other emergency responses. The estimated costs of the haze to Singapore in 2015 was between S\$700 million (AsiaOne, 2016) and S\$1.83 billion (Quah & Chia, 2019).

Transboundary haze has been recorded in Southeast Asia as far back as 1982. The Association of Southeast Asian Nations, or ASEAN, the regional organisation consisting of 10 member states (Brunei Darussalam, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand, and Viet Nam), began to acknowledge haze as a serious regional environmental problem as early as 1985, with the Agreement on the Conservation of Nature and Natural Resources, which specifically referenced air pollution and related 'transfrontier environmental effects'. ASEAN's haze governance framework continued to take shape over subsequent years, most notably with the 1997 Regional Haze Action Plan, the 2002 ASEAN Agreement on Transboundary Haze Pollution (AATHP) and the 2016 Roadmap on ASEAN Cooperation Towards Transboundary Haze Pollution Control with Means of Implementation. ASEAN's haze governance framework is notable in itself, not least for gaining universal ratification of the legally binding AATHP against the backdrop of a regional geopolitical culture that favours non-binding policy instruments. Furthermore, decades of very visible ASEAN-level cooperation have built up ASEAN's reputation as the centrepiece of transboundary cooperation around haze governance in the region.

Despite decades of vibrant ASEAN-level cooperation and collaboration, transboundary haze remains a chronic regional environmental problem today. The growing academic literature on haze governance has largely focused on the national or supranational scalar of reference in the context of ASEAN. This paper contributes to the new but growing literature that argues that haze should be treated as a challenge for transboundary governance and not merely transnational governance. This paper focuses on Singapore, a place where the impacts of transboundary haze are acutely felt and also an important site of transboundary commons in response to haze. While the Singaporean government's role in transboundary haze governance is well covered in the literature, less is known about the role of Singapore's non-state actors. The paper begins with a review of the literature on the role of non-state actors in the governance of transboundary environmental commons and its potential to reposition the state away from being the sole arbiter of political power. It then details three interactive case studies within the national context of Singapore where various non-state actors have negotiated, contested, and transformed spaces for decision-making over transboundary haze, engaging at various scales of governance to bridge policy gaps in the national and regional transboundary haze regime. Finally, it discusses how understanding these emergent geographies of transboundary haze governance can provide a better understanding of how nonstate actors can influence decision-making within the broader ASEAN geopolitical culture favouring depoliticised 'engaged non-indifference' (Pelling, 2011).

Commons are environmental goods that traverse jurisdictions and property regimes within and between nation-states. Miller, Rigg, and Taylor (2020) identify two types of transboundary commons, mobile commons and in-situ commons. Mobile resources such as air, water, and certain migratory species, are classic examples of nature confounding territory: they move across public, private, and societal governance regimes and thus cannot be contained within demarcated spaces and bounded regulatory bodies. In situ commons include spatially fixed resources such as national parks, conservation areas, mangrove forests, and fisheries, often located within a single jurisdiction but deliver ecological benefits across these jurisdictions and involve the co-governance of geographically and often temporally distant users of these resources.

In situ commons frequently converge with mobile commons in the face of an emerging environmental crisis. In littoral Southeast Asia, peat forests are a form of in situ commons. Tropical peat forests are an important carbon sink and, as such, represent public goods of international value. Forest litter that falls into the dark water remains in a semi-decomposed state, eventually forming layers of carbon-rich soil locked away underwater. Naturally waterlogged, peat forests very rarely catch fire. Fire risks here increase under severe drought conditions, or more commonly, due to human-induced drainage activities for land-use change, normally for agriculture. Sometimes, fire is also intentionally used to clear land quickly and cheaply. During a peat forest fire, the carbon-rich soil also alights and can remain smouldering for months. These fires release large amounts of carbon from underground in the form of thick, sooty smoke haze that can travel considerable distances. Peat fires in southern Southeast Asia often occur in Indonesia's peat-dense Sumatra and Kalimantan regions, and to a lesser extent, in Peninsula and East Malaysia. The El Niño Southern Oscillation (ENSO) is a coupled climate phenomenon that, over a few years, swings between drier (El Niño) and wetter (La Niña) conditions in the region. During moderate or severe El Niño years, drier regional conditions transport smoke haze from southern Southeast Asia across the region and beyond. In this way, biomass fires situated within in situ commons (peat forests) become a transboundary governance problem for the mobile atmospheric commons. Severe transboundary haze incidents have occurred in 1997–1998, 2006, 2009, 2010, 2013, 2015, and, most recently, in 2019.

Environmental governance is understood as ways to manage common-pool resources and formulate collective responses to environmental threats and crises shared in common. The term 'governance' implies a focus on systems of governing, or 'authoritatively allocating resources and exercising control and coordination' (Rhodes, 1996). Beyond a technical and managerial approach, governance can also be defined as the ways in which 'power is exercised through a country's (or, in the case of this paper, region's) economic, political, and social institutions' (World Bank Group, 2009). Governance is also associated with a diversity of stakeholders involved in collective decision making (Miller, 2020). Environmental governance, then, is the set of regulatory processes, mechanisms, and organisations through which political actors influence environmental actions and outcomes (Lemos & Agrawal, 2006).

Within the tradition of international relations, the governance of environmental commons often assumes the need for the formation of international institutions to facilitate cooperation (Bulkeley, 2005). These 'social institutions that consist of agreed-upon principles, norms, rules, decision-making procedures, and programmes that govern the interactions of actors in specific issue areas' (Young, 1997), are known as regimes. However, within such regimes, authority, power, and legitimacy are still mainly understood as residing within nation-states. Regimes can be seen to both strengthen the territoriality of nation-states (by reinforcing the importance of the inter-state system) and weaken the notions of territorial sovereignty (by allowing international institutions to regulate processes occurring within these state spaces). While such regimes may assume a degree of control over states, they are seen to be created by and for states. This has been described as the 'territorial trap' associated with regime theory, which takes for granted the state space as a demarcation of political power (Bulkeley, 2005). However, a more dynamic view of the commons uses a power-based approach that emphasises the abilities of (other) key actors to catalyse environmental change in response to social realities, thereby allowing consideration of a wider range of relationships in environmental governance regimes. Mobile and in situ commons in the region have historically been formed through such hybrid bundles of formal and informal power relations. These hybrid arrangements combined old (community-based) bundles of power with new powers, as represented by governments and markets in novel reconstitutions of resource geographies. These novel arrangements often have specific implications for key governance issues that are emerging in Southeast Asia's transboundary commons (Miller, Middleton, et al., 2020).

Recent scholarship unpacking the multi-scalar (spatial, sociopolitical, and temporal) character of environmental commons problems has thus underlined the limitations of addressing such problems through the predominant configurations of national or supranational analysis (Lemos & Agrawal, 2006). Scholars have described the 'hollowing out' of the state, where political power and functions of the state are redistributed not only upwards through international regimes, but also downwards, to various sub-national levels, and outwards, to non-state actors in various emergent 'geographies of governance'. This 'devolvement' of environmental governance is not necessarily driven or guided by nation-states but are often created and reproduced by local authorities, international institutions and non-state actors. However, the state regime approach of environmental governance does not account for these environmental governance arrangements. These arrangements can be multi-sectoral, involving a mix of state and nonstate actors (e.g. think tanks, charities), or private (multinational corporations, local retailers) and societal (peatland communities) actors without state involvement. They can at the same time also be multiscalar, including actors from different levels of governance simultaneously (sub-state, state, regional) (Bulkeley, 2005). Hence, there have been calls for a 'post-sovereign' account of environmental governance to better represent these emergent governance arrangements (Karkkainen, 2004).

Scholars studying transboundary environmental governance arrangements in Southeast Asia (Hirsch, 2020; Marks et al., 2020; Miller, Middleton, et al., 2020) have called attention to the conflation between

transnational and transboundary environmental governance in the literature. Transboundary environmental governance is the collective of state, societal, and private sector decision-making, norms and practices that shape the formal and informal (re)distribution of environmental costs and benefits across territories and time frames (Miller, 2020). While transnational governance limits the study of cross-border relations for governing common-pool resources to national or supranational scales of analysis, transboundary environmental governance encompasses resource connections that traverse borders at all scales of governance (Miller, 2021). While transnational commons focuses on the international (inter-state) dimensions of dispersed and overlapping resource regimes (Miller, Rigg, & Taylor, 2020), transboundary commons also describe the networked political relationships, revenue streams, labour mobilities, and environmental flows that move across subnational boundaries (Miller, Middleton, et al., 2020). In short, transboundary environmental networks and agreements are those that are both horizontally (multi-scalar, across borders within and between countries) and vertically (multi-sector, to connect grassroots actors with higher levels of government, NGOs, donors, and corporations) enacted (Miller, 2020).

The danger of conflating transboundary with transnational forms of governance can lead to an overexaggerated aggregation of national benefits, costs and risks. Failures to address governance challenges are often explained through the states' or institution's political culture limitations, dominant developmental agenda, or weak regulatory remit of the national or supranational agencies (Hirsch, 2020). Several scholars have observed this in the context of environmental commons issues in Southeast Asia: hydropower in the Mekong, transboundary haze (Hirsch, 2020) and marine plastic pollution (Marks et al., 2020). Indeed, notable works on haze governance have focused on the supranational level by examining the overall ASEAN haze regime (Jones, 2004; Nguitragool, 2010; Nurhidayah et al., 2015; Sunchindah, 2015) or closer analysis of specific instruments like the 1997 Regional Haze Action Plan (Florano, 2004) or the 2002 ASEAN Agreement on Transboundary Haze (Florano, 2003; Karim, 2008; Nguitragool, 2011; Nurhidayah et al., 2015; A. K.-J. Tan, 2005; Varkkey, 2014). Another series of works have contextualised the operationalisation of the ASEAN haze regime at the national level, most commonly Indonesia (Heilmann, 2015; Hurley & Lee, 2020; Jerger, 2014), and sometimes Malaysia and Singapore (Palanissamy, 2013; Varkkey, 2011). Indeed, three analytical themes stand out: (1) the limitations of the 'ASEAN Way' geopolitical culture predicated on non-interference, (2) the positioning of the interests of one developmentalist state versus another against the backdrop of a developmentalist institution (ASEAN), and (3) the inability of state agencies to implement policies and regulations within the local cultural context.

In short, questions of sharing and conserving common pool resources have remained, in the regime theory tradition, predominantly fixed at the national or supranational scale of governance (Hirsch, 2020). Given this disproportionate emphasis on the national and supranational levels, further research on the transboundary level is important to better understand how sub-national actors and processes connect with higher organisation scales of governance and interact across sectors of expertise to address governance gaps. Such research will not only fill empirical gaps, contributing

to a literature that has thus far mainly focused on the above three (supra)national scale themes, but also contribute to theoretical gaps by moving beyond regime theory understandings of common pool resources to encompass various connections that traverse borders at all scales of governance. Furthermore, this paper will also contribute to a better understanding of the position of NGOs in ASEAN. ASEAN has often been critiqued as an 'elitist' organisation with limited space for nonstate actors, particularly in the human rights arena (Noortmann, 2021; Rüländ, 2014). By centring on NGOs, this paper engages with the literature on NGOs' power (or lack thereof) within the ASEAN governance framework, questioning conditions in which such NGOs may render themselves more 'powerful'.

Lemos and Agrawal (2006) focus on three different social mechanisms consisting of the state, market, and community to describe such emerging hybrid modes of governance: co-governance (between state agencies and communities), public-private partnerships (between state agencies and market actors), and social-private partnerships (between market actors and communities). The emergence of these forms of environmental governance is rooted in the recognition that no single agent possesses the capabilities to address the multiple facets, interdependences, and scales of environmental commons problems (Brenner, 2001). The capacity of communities, in particular, to wield more power for situated commoning initiatives depends on their tactical and ideological openness to embracing key areas of compatibility with outside (often transboundary) market agendas (Miller, Middleton, et al., 2020). They thus adopt a politics of scale approach to focus on the 'shifting organisational, strategic discursive and symbolic relationships between a range of intertwined geographical scales and the ramifications of such inter-scalar transformations for the representations, meanings, functions and organisational structures of those scales' (Brenner, 2001).

3 | METHODOLOGY

This paper's geographical focus is on Singapore, a small island citystate between two larger neighbours, Indonesia and Malaysia. The study focuses on Singapore due to its regional importance both as a site of transboundary commons in response to the problem of haze pollution and a place where the impacts of this 'tragedy of the commons' are the most acutely felt. The literature has extensively discussed the role of the Singapore state and its corporate actors in transboundary haze governance. The government of Singapore has been actively involved in transnational haze governance at the ASEAN level (Varkkey, 2011). It was the second member state to ratify the AATHP in 2003, hosts the ASEAN Specialised Meteorological Centre (which holds the mandate for monitoring and assessment of haze in the region), and was the main proponent for a stronger ASEAN SubRegional Haze Monitoring System (HMS) based on the open sharing of land use and concession maps for improved monitoring. The literature has described how the state has established novel transboundary approaches to haze governance (Francesch-Huidobro, 2008; E. K. B. Tan, 2018), most notably through its 2014 Transboundary Haze Pollution Act (THPA) (Bassano & Tan, 2014; Ghosh et al., 2020; R. N. Hong, 2016; Lee et al., 2016; A. K.-J. Tan, 2015b). The THPA extends extra-territorial jurisdiction to the business

sector by imposing fines on any company whose operations in neighbouring countries were found to contribute to haze within Singapore's borders. Developed in consultation with civil society organisations and academics, the enactment of this law offers an example of transboundary haze governance acting across national and supranational scales by seeking redress directly with private businesses instead of the home states of those businesses (Miller, Middleton, et al., 2020). Sustainability challenges and transitions of Singapore-based companies in haze-linked sectors have also been well documented in the literature (Chander, 2017; Padfield et al., 2016; Rabiul Islam, 2020; Siddiqui, 2018; Varkkey, 2016).

What is less known is the role of Singapore-based non-state actors working across organisational scales and sectors of expertise to complement, support, and influence these actions and outcomes. This paper thus aims to contribute to the literature on Singapore's role in transboundary haze governance by focusing on Singapore's transboundary publics as communities of commoning. The interactive case studies will focus on the activities of three prominent Singaporean non-state actors: the Singapore Institute of International Affairs (SIIA), Singapore Environment Council (SEC), and People's Movement to Stop Haze (PM Haze). These three actors were chosen because (1) they have identified haze as either a clear *raison d'être* (PM Haze) or as among their priority areas of interest (SIIA and SEC) and (2) all three engage actively with the Singaporean government and market actors in their haze-related activities. Importantly, these interactive case studies will illustrate how these non-state actors fit into the wider Singaporean and regional transboundary haze governance framework. While the paper focuses on one specific type of actor (non-state), the analysis contextualises the activities of these nonstate actors within their interactions with other key governance actors like the state and corporate actors, and emphasises how such collective interactions can contribute to and build upon existing transboundary haze governance ecosystems.

This study draws from a combination of documentary content analysis and qualitative interviews. Purposive (selective) sampling techniques were used to interview respondents based on existing contacts maintained through the author's past works. Four semi-structured, in-depth interviews were carried out to collect primary data for this paper. Two interviews were with high-level representatives from the SIIA and PM Haze in September and October 2021. Two more interviews, with representatives from the corporate (Sinar Mas Group, parent company of Asia Pulp and Paper or APP) and civil society (Haze Elimination Action Team or H.E.A.T., a volunteer group aiming to sue and boycott companies linked to haze) sectors, were carried out in February 2022. The interviews, which lasted between 60 to 90 minutes each, were recorded, and the findings were triangulated with secondary data, including in-house publications and related media coverage. The interview method was well suited to evaluating different perceptions and understandings of the rationale and intervening factors that may have influenced target actors' decision-making, which may not always be openly stated. Two underlying themes underpinned questions that guided the semi-structured interviews: (1) the opportunities and limitations of a Singaporean NGO working in a cross-border context, and (2) linkages and engagement with the Singaporean state and the other NGOs examined. Inputs from the National Environment Agency (NEA), a statutory body under the Ministry of Sustainability and the Environment overseeing

the implementation of environmental policies towards a clean and sustainable environment in Singapore (NEA, 2022), was obtained via email communication. Due to travel limitations imposed by COVID-19, interview findings were triangulated where possible through qualitative documentary analysis (journal articles, books, organisational reports and websites, legislation, and media content). This documentary content analysis was conducive to corroborating specific events, timelines, and outcomes of data obtained through interviews. The author's observations as a participant and observer in various events organised by the SIIA over the past 8 years, and other casual and formal conversations with various representatives from these organisations during this time, also informed the analysis.

4 | SINGAPORE'S TRANSBOUNDARY PUBLICS

As political spaces for governing common resources across national borders, transboundary commons become the site for geographically dispersed communities to assemble around environmental solidarities, collective practises, and mutual interests (Marks et al., 2020) – the unifying 'glue'. In the literature, such relationships have been described as 'transboundary publics' (the preferred term for this paper), 'transboundary coalitions', 'transboundary communities of commoning', 'dispersed environmental collectives', 'collaborative governance partnerships', or 'collective environmental stewardship'. Previous studies have observed how Indonesian peatlands are physically located in a single jurisdiction but are governed by transboundary publics (Astuti, 2020; Miller, 2021; Pye, 2010). This paper aims to take a more site-specific view of these observations by focusing on the transboundary governance arrangements that remain multi-scalar and multi-sectoral, but with the main actors originating in one state. This allows us to consider more closely if and how these 'commoning' activities privilege the relationship between human interests internal to political boundaries (Singapore) and the external balancing of mutual geopolitical interests (Indonesia, Malaysia, ASEAN) (Miller, 2020).

Singapore has a negligible amount of peatland areas, and what little remains are well-managed. Hence, peat fires do not generally occur in Singapore. However, due to its proximity to the peat-rich Indonesian provinces of Riau and Jambi in Sumatra island, Indonesia, and Johor, Malaysia, it is often engulfed with haze when peat fires occur there. Singapore is also the headquarters of several prominent agribusiness companies operating in these neighbouring regions, which are involved in sectors that have been linked to fires and haze, like palm oil and pulpwood (Varkkey, 2016). Singapore's small size means that any haze incident is likely to affect the entirety of the island and its population. The seasonality of the haze often means that haze episodes coincide with (and disrupts) Singapore's grand outdoor National Day Parade on 9 August. Singapore experienced its worst-ever haze day in 2013, when its Pollutant Standards Index (PSI) reached 401 at noon, mirroring PSIs in nearby Indonesia at the time (BBC, 2013).

This paper's geographical focus on Singapore furthermore speaks to the growing prominence of urban-based transboundary publics. Cities are sites of dense knowledge systems, ideas, and technologies around which

many relationships can develop, including through noncapitalist, non-hierarchical social structures (Miller, 2020). Indeed, Singapore is a city-state and not a traditional city. Post-independence, Singapore's leaders engaged in a deliberate depoliticisation of the Singaporean polity, including legal and extra-legal limits to all political and social activities (D. Hong, 2017). This cultivated political apathy among Singaporeans, where citizens felt that they did not have access to state power and could only influence government policy on the margins (Chin, 2016). More recent leaders have promoted 'active citizenry' to enhance state legitimacy and improve trust between the state and civil society (D. Hong, 2017). This liberalisation of the civil society arena happened alongside co-option (for example, where all civil society associations would have a Member of Parliament on their board or as an advisor) (H.E.A.T. Interview, 2022), establishing a 'warm' relationship between civil society and the government, tied by funding opportunities or collaborations. This resulted in a 'self-monitoring, self-restraining' civil society in Singapore, even while collaboration and co-creation of policies were encouraged (D. Hong, 2017).

While these circumstances have cultivated a civil society that can be considered 'weak', this paper posits that Singaporean hazefocused civil society groups can potentially play comparatively more powerful roles in transboundary haze governance. Constrained by ASEAN's geopolitical culture of non-interference in domestic affairs and its nonconfrontational approach to tackling transboundary environmental problems, Singapore's transboundary power in haze governance is limited. At the same time, Singapore and Indonesia have deep business and investment links that flow both ways (Natasha, 2009; Pangarkar & Lim, 2003), limiting the willingness of market and corporate actors in Singapore to put economic pressure on their Indonesian counterparts complicit in haze (H.E.A.T. Interview, 2022). With two of the three social mechanisms as identified by Lemos and Agrawal (2006) rendered less powerful due to external circumstances, the power of Singapore's civil society can, by default, be amplified. In emerging hybrid modes of governance, civil society groups can complement government efforts by bridging policy gaps in formal haze governance regimes in the region (co-governance). At the same time, these transboundary publics can engage with corporate actors in both Singapore and Indonesia on key areas of compatibility in both Singapore and Indonesia (socio-private partnerships) to support a haze-free market agenda. The depoliticised geopolitical environment in this advanced city-state creates ideal conditions for mobilising transboundary publics across borders, especially within the geopolitical cultural context of ASEAN.

The SIIA, SEC, and PM Haze have been the most active Singaporean organisations working at various transboundary scales and sectors using multiple strategies to mobilise transboundary publics in Singapore and beyond over the haze issue (see Table 1). The SEC and PM Haze are both Singaporean NGOs, with the SEC having a broader environmental remit compared to PM Haze which focuses primarily on haze pollution. Formerly known as the National Council of the Environment, the SEC was re-established in 1995. With its long history, it can be considered Singaporeans' 'first port of call' and reference point for all things related to the environment. In 2018, it was granted United Nations Environment Programme (UNEP) accredited environmental NGO status. The SEC has been described as a GONGO, or 'near-state NGO' (Cotton, 1999), and the

'people's' branch of the Singaporean ministry in charge of the environment (Francesch-Huidobro, 2008). The SEC developed the Singapore Green Label (SGL) scheme, a green certification process recognised by the Global Eco-Labeling Network, in collaboration with the NEA. The SGL TABLE

and International Studies (ASEAN-ISIS), a network of think tanks recognised by ASEAN as a valuable mechanism for policy-making in the region (SIIA, 2021b), and served as its 2020 chair. Track II diplomacy describes methods of diplomacy outside the formal government system, arising from the understanding that official, government-to-government interactions were not necessarily the most effective methods for securing international cooperation or resolving differences (Mursitama, 2012). Track II involves

1 Summary of features of the three organisations studied

Organisation	Type (self-defined)	Founded	Funding	Strategies	Transboundary scales	Sectors
Singapore Institute of International Affairs (SIIA)	Non-profit independent think tank	1962	Research grants (including from government), private donations, corporate sponsorship, membership subscriptions	Track II diplomacy, policy analysis, high-level dialogues	Regional, national	ASEAN, Singaporean and neighbouring state governments, multinational corporations
Singapore Environment Council (SEC)	Independently managed, nonprofit NGO and institution of public character	1995	Government grants, private donations, corporate sponsorships	Sustainability certification, Track II diplomacy	Sub-national, national, regional	Multinational corporations, Singaporean retailers, Singaporean public
People's Movement to Stop Haze (PM Haze)	Not-for-profit society with charity status	2014	Private donations and organisational sponsorship, including from the SIIA	Sustainability certification, peatland rehabilitation and livelihood projects	Sub-national, national, regional	Singaporean eateries, Singaporean public, peatland communities in Indonesia and Malaysia

SEC has administered the labelling scheme since 1999 and has now certified over 3800 unique products (SEC, 2021b).

PM Haze organises around concepts of sustainable consumption (haze-free palm oil) and sustainable livelihoods (peatland protection). It focuses on outreach, research, and advocacy at the local and regional levels towards finding solutions to transboundary haze. Its transboundary activities have been driven by the intention to build a bridge between Singaporean consumers and neighbouring producer communities while educating Singaporeans on the root causes and scale of the problem. An important factor that has facilitated PM Haze's work in Indonesia (unlike some other, usually Western-based environmental NGOs, which have generally been treated with higher degrees of suspicion) (Jordan & van Tuijl, 2012; Pramudya et al., 2018) is its stance of not being 'anti-palm oil'. Its push for sustainable palm oil has positioned PM Haze as an actor with similar worldviews to the Singaporean and Indonesian states, business and peatland communities it works with, in addition to sharing an environmental agenda of peatland conservation and sustainable livelihoods with these communities (PM Haze Interview, 2021).

The SIIA is a Singaporean think tank emphasising themes of ASEAN regionalism and environmental sustainability. It focuses on producing policy analysis and fostering dialogues between government policymakers, the private sector, and experts to bridge gaps and shape public policy and social responses (SIIA, 2021a). The SIIA is a prominent actor within ASEAN's 'Track II' diplomacy. It is a founding member of the ASEAN Institute of Strategic

understanding, and collaboration towards shared problem-solving. This can affect the thinking and action of Track I (governments) by addressing the root cause, feelings, and needs and exploring diplomatic options without prejudice, thereby laying the groundwork for formal negotiations or reframing policies (Mursitama, 2012). Scholars have noted the important role that Track II diplomacy has played in ASEAN's regional processes (Caballero-Anthony, 2018; Kraft, 2000; Morada, 2007; Mursitama, 2012), as an especially fitting mode of diplomacy within ASEAN depoliticised geopolitical culture, while corporate and civil society stakeholders have noted the positive role of SIIA in fostering greater understanding between Singaporean and Indonesian ministries (H.E.A.T. Interview, 2022; Sinar Mas Interview, 2022).

While not formally linked to each other, the activities of these organisations nevertheless have converged in three major areas: (1) initiating Track II engagement, (2) moderating government and private sector relations, and (3) public advocacy and community engagement. The discussion below details how, through these efforts, political power has moved beyond the Singaporean state, being redistributed downwards, outwards and even upwards in emergent geographies of transboundary haze governance. Furthermore, all three organisations studied engage with the Singaporean government in various forms and intensities. Thus the Singapore context presents an ideal context to examine how co-governance between state agencies and communities across scales, engaging with

actors across sectors, can contribute to the bridging of policy gaps in formal haze governance regimes in the region.

4.1 | Initiating Track II Engagement over Haze

Despite regional governance mechanisms like the 1995 Cooperation Plan on Transboundary Haze Pollution and the 1997 Haze Action Plan, Southeast Asia suffered its worst-ever transboundary haze episode in 1997–1998. Following this, the SEC organised an International Policy Dialogue on the Southeast Asian Fires in 1998. The Dialogue was attended by 45 representatives from 31 entities, including international and regional NGOs (including the SIIA), private corporations, state agencies, the ASEAN secretariat, and other international institutions. This Dialogue marked the start of a network comprising national, regional, and international environmental NGOs (Francesch-Huidobro, 2008) that were committed to working to ‘develop smooth working relations with the state by not raising matters of contention at international forums which it has not already raised through direct dialogue with their governments’ (Aviel, 2000). Key findings of the dialogue included recognising that the fires were mostly human-induced and linked to the private sector through land clearing practices by large palm oil and rubber businesses. The network called upon Indonesia to recognise its obligation to cooperate with other relevant bodies in the region in dealing with the fires, reform its land-use policy to ensure sustainable use, and offer tenure to users to empower them and recognise their interests (Francesch-Huidobro, 2008).

The recommendations from the Dialogue were presented to the Singapore Ministry of Environment and Water (MEWR, renamed Ministry of Sustainability and Environment in 2020) for them to share at the ASEAN level. The MEWR, however, was concerned that the recommendations may be construed as going against the ASEAN fundamental principle of non-interference. Instead, Singapore used its position as the host of the 1998 ASEAN Senior Officials for the Environment meeting to arrange for a Dialogue representative to present the recommendations on behalf of regional NGOs at the meeting (SIIA Interview, 2021). This event was notable as the first time that NGOs were given a right of audience in an ASEAN meeting (Francesch-Huidobro, 2008). Furthermore, while the issues raised were contentious, positioning the Dialogue's recommendations as a regional, and not purely Singaporean perspective made them more palatable (SIIA Interview, 2021).

As the haze issue ‘developed into a matter better dealt with through intellectual and Track II policy exchanges rather than through purely environmental advocacy’ (Francesch-Huidobro, 2008), the SEC stepped back from haze issues in favour of the SIIA. Through the ASEAN Track II network, the SIIA played an important role as a pathfinder for new governance directions on haze. For instance, amid political tensions in the aftermath of the 1997–1998 haze episode, the SIIA leveraged upon the ASEAN-ISIS network, particularly the Centre for Strategic and International Studies (CSIS) Indonesia, to secure an audience with the Indonesian Minister of the Environment to discuss productive ways forward on regional haze cooperation (SIIA Interview, 2021). Soon after, in 2002, the landmark legally binding AATHP was agreed upon by all ASEAN member states. This

relationship continued over the years, with the SIIA enjoying direct access to Indonesian and Malaysian policymakers facilitated by the ASEANISIS network, the results of which could then be communicated back to Singaporean policymakers and vice versa.

4.2 | Moderating government and private sector relations

The SIIA's research and analysis work noted how Singapore's unique position as the headquarters or regional base for prominent agribusiness firms (see Table 2) operating in Indonesia and Malaysia could potentially offer avenues for transboundary governance solutions for haze pollution, particularly within the context of the corporate and financial sector (SIIA Interview, 2021). During the time that Simon Tay, an environmental legal academic and the SIIA's Chairperson, was appointed as chair of the NEA (2002 to 2008), various closed-door meetings were co-organised by the SIIA and the NEA with prominent TABLE 2 Palm oil growers, traders, and processors with presence in Singapore (PM Haze, 2018b)

Name	Presence in Singapore	Listed on Singapore Exchange
Wilmar international	Headquarters	Yes
Olam International Ltd	Headquarters	Yes
Golden Agri Resources Ltd	Headquarters	Yes
First Resources Ltd	Headquarters	Yes
Bumitama Agri Ltd	Headquarters	Yes
Indofood Agri Resources	Headquarters	Yes
Kencana Agri Ltd	Headquarters	Yes
Mewah International Inc	Headquarters	Yes
Global Palm Resources Holdings Ltd	N/A	Yes
Musim Mas Group PT	Headquarters	N/A
Cargill Inc	Asia-pacific hub	N/A

members of the business community to highlight this link and to nudge these companies with local presence towards more proactive involvement of their operations overseas (SIIA Interview, 2021). This relationship evolved alongside a growing willingness for Singapore to engage more proactively with transboundary haze issues at a regional level, corresponding to the growing awareness of the extent of the accumulating problem within the region.

After an intense period of parliamentary debate on the severe haze affecting Singapore in 2013 (Ministry of Law, 2021), Singapore announced a series of regional and national governance mechanisms to hold the private sector accountable for causing haze in Singapore. At the ASEAN Level, Singapore publicly pushed for ASEAN member states to openly share

accurate and official concession maps to be used for a Singapore-funded S\$100,000 ASEAN Sub-Regional Haze Monitoring System (HMS), capable of overlaying land concession maps with high-resolution satellite images to allow authorities to identify those responsible for start forest fires to clear land illegally. The regional grouping ultimately adopted the HMS without the element of open-source map availability, as Indonesia and Malaysia cited that their laws did not allow public access to such data. The HMS is currently operating ad-hoc, where maps are requested and shared on a case-by-case basis (Lim, 2013; Today, 2013; Woo, 2013).

A regional NGO Roundtable on Environment, Sustainability and Climate Change convened by the SIIA in 2013 proposed that governments should introduce new legislation that will penalise companies guilty of using fire to clear lands (Reyes, 2013). The SIIA then held its inaugural Singapore Dialogue on Sustainable World Resources (SDSWR) in 2014. PM Haze also held its first public exhibition, 'We Breathe What We Buy: XtheHaze', in collaboration with WWF and the SIIA at this event (PM Haze, 2016). The SDSWR has become the

SIIA's flagship event involving government officials, industry, civil society, and experts and enjoys robust media attention. Such dialogues are especially valuable for bringing to the table government officials for open discussion without diplomatic formalities and for them to gauge the sentiment of the region, which they will then take back home as background knowledge to consider during policy-making (Varkkey, 2011). It also offers an important neutral platform or 'safe space' for corporate players to air their positions, candidly discuss challenges faced, and explore and coordinate possible solutions (Sinar Mas Interview, 2022). Government officials and industry leaders have strategically used the SDSWR to signal key decisions and developments. For example, MEWR Minister Dr Vivian Balakrishnan used his keynote speech during the 2014 SDSWR to signal to the region that Singapore was planning to enact local legislation to address transboundary haze in Singapore (Balakrishnan, 2014). The THPA was later enacted in September 2014 (Transboundary Haze Pollution Act, 2014).

Following the 2015 haze episode, the NEA began legal action against APP, a major pulp-and-paper firm with headquarters in Singapore, concerning fires detected on the lands of four of its suppliers (Bumi Andalas Permai, Bumi Mekar Hijau, Sebangun Bumi Andalas Woods Industries, Rimba Hutani Mas) in Indonesia. While the NEA's investigations were hindered by legal complications of operationalising the extra-territorial law without the cooperation of the home country where the fires occurred (Raymond, 2018), the SEC suspended APP's SGL certification due to non-compliance with its standards. The SEC and The Consumer Association of Singapore (CASE) then jointly urged leading supermarkets, pharmacies, and furniture retailers to declare that their wood, paper and/or pulp materials were produced from sustainable sources (SEC & CASE, 2015). In response, NTUC FairPrice (Singapore's largest retail chain with close links to the ruling People's Action Party) removed APP paper products from its shelves, prompting 16 other Singaporean retailers to follow (Siddiqui, 2018; Wijedasa et al., 2015). Among the more public responses to this move were promises of 'zero' haze by Mr Nazir Foad, head of Indonesia's Peatland Restoration Agency (Badan Restorasi Gambut or BRG, set up in 2016 to restore two million hectares of fire-prone peatlands in Indonesia), at the 2016 SDSWR (Khaw, 2016).

The SEC later developed an Enhanced Singapore Green Labelling Scheme for Pulp and Paper Products in 2017 (accredited in 2019) in collaboration with its stakeholders, including APP (Sinar Mas Interview, 2022). This included requirements for peatland management, zero burning, and early detection and suppression of fires when they do occur (SEC, 2021a). Following this, APP invested over US \$150 million in an Integrated Fire Management System for prevention and suppression to meet the Enhanced SGL requirements (Hicks, 2019), in a clear demonstration of how Singaporean market actors can affect shifts in corporate practises across borders, affect power dynamics, and lead to governance reforms. In addition, the invitation extended to Mr Franky Oesman Widjaya, Chair and CEO of GoldenAgri Resources (part of the Sinar Mas Group to which APP also belongs), to act as Panel Keynote at the 2019 SDSWR arguably played a notable role in resolving tensions surrounding the APP suspension and in further paving the way for APP products to return to Singaporean shelves (SIIA Interview, 2021). He spoke about stopping the blame game and allowing governments and businesses to work collaboratively (SIIA, 2019). This judgement call was rooted in the SIIA research and analysis into the Sinar Mas Group's sustainability efforts (SIIA Interview, 2021). In the last 8 years, the SDSWR has developed into an important platform to nudge corporate players towards sustainability and signal to governments about favourable corporate developments, a trend that will likely continue with the introduction of Singapore's carbon stock exchange, the CIX (Singapore Exchange Limited, 2021). The event consistently receives both corporate sponsorship and state funding support through the philanthropic arm of its state sovereign fund, Temasek Foundation.

4.3 | Public advocacy and community engagement

While the SIIA has been credited for 'mainstreaming' the haze agenda among the Singaporean and regional public (Varkkey, 2011), PM Haze received early funding from the SIIA to specifically focus on outreach and advocacy aspects of the haze, at both the national and regional level. Locally, PM Haze engages with consumers and businesses to drive the supply and demand sides of sustainable palm oil (PM Haze, 2018b). On the business side, PM Haze's 'Haze-Free Foodstand' campaign encouraged local eateries to switch to sustainable palm oil suppliers using the RSPO label by focusing on rising consumer demand for sustainable products and benefits to their corporate image. As of 2019, 10 food and beverage brands amounting to around 200 outlets around Singapore serve food cooked with sustainable palm oil, an increase from only two outlets in 2015 (PM Haze, 2019).

On the consumer side, campaigns like 'We Breathe What We Buy: XtheHaze' and '#gohazefree' focused on empowering Singaporeans with the knowledge, means, and values to enable them to make 'hazefree' consumer choices by raising awareness about sustainable palm oil and paper through public education and awareness-building roadshows, workshops, and public talks (Angela & Hikam, 2019). Alongside PM Haze's efforts, the SEC's suspension of the SGL for APP products further increased public awareness nationwide on the link between fires, haze, and Singapore-linked businesses operating in Indonesia (A. Tan, 2015a), and

also the awareness about certification schemes in general (for example, RedMart created an 'FSC Certified' filter within its paper and tissue category) (TODAY, 2015). Taken together, such buyer-focused efforts aim to amplify consumer power, to address the inherent power imbalance of the transboundary haze issue where the general public bears the brunt of the haze's negative effects, while complicit businesses stand to gain the most. This furthermore connected more widely with an emerging trend towards ethical consumerism among the region's middle classes, as evidenced in public surveys conducted in Singapore, Malaysia, and Indonesia in 2019 (Alfajri et al., 2021; Ives et al., 2020; Wong et al., 2020). The state perceives these efforts to be of significant value: 'Civil society plays an important role in fostering an informed consumer movement and strengthening support for sustainably-sourced products' (NEA email communication, 2022).

Focusing on common conceptions of sustainable peatland livelihoods and resilience-building, PM Haze also directly works with peatland communities in Indonesia and Malaysia to develop community-centric protocols that empower communities to restore peatland areas. PM Haze works through its network of regional NGOs to identify sites for public engagement. For example, the Sungai Tohor site in Tebing Tinggi, Riau, was identified and facilitated through Walhi Riau and Jikalauhari Riau, provincial chapters of national environmental NGOs. Extensive consultations with the local community revealed that while many canal blocks have been built by either government agencies, companies, or other NGOs to manage peat water levels, they quickly fall into disrepair as the community was not involved in the process and thus had limited resources and knowledge on the upkeep of these canal blocks (PM Haze Interview, 2021). Hence, PM Haze worked with a local NGO, Ekonomi Kreatif Andalán, the Tebing Tinggi District Government, and Sungai Tohor Village Government to repair existing canal blocks and empower and build capacity among villagers to maintain canal blocks and protect peatlands. This has laid the groundwork for sustainable livelihood programmes in the village, focusing on green economic initiatives to improve agricultural livelihoods in the area while conserving peatlands (PM Haze, 2018a, 2019). Positive feedback from the local community on these projects have been documented by local media (Fitria, 2022; Gopesisir.com, 2020; Riauin.com, 2021; Riautempo.com, 2020; Tis, 2020).

Such cross-border, multi-scalar collaborations are valuable, particularly as the Indonesian central government has announced the discontinuation of government-to-province level programmes to address haze like the Singapore-Jambi MoU and the Malaysia-Riau MoU, in favour of a reversion to government-to-government level cooperation (The Sun, 2016). Media coverage of PM Haze's cross-border work is particularly important for building awareness of the root causes and scale of the haze problem in Singapore. However, journalists can sometimes take a politically sensitive angle for these pieces, say that of a foreign NGO stepping in to solve local problems (Taylor, 2019) (e.g., when an article featured Benjamin Tay, executive director of PM Haze, using a fireman's hose to help douse peat fires in Riau) (Oh, 2019). PM Haze has been able to tap into its linkages with the Singaporean government and Indonesian NGOs for advice and assistance in navigating the fallout of such isolated events, and, more importantly, ensure that cordial diplomatic relationships are maintained.

Hirsch (2020) has noted that in Southeast Asia, transboundary investment, revenues, and power scales are integral to the driving of impacts on environmental commons. However, the means to govern such cross-border flows are largely institutionally separate from the transnational governance arena (see also Nesadurai, 2017). This amplifies Singapore's unique position as the regional economic centre and financial hub and increases the leverage of non-state actors based in Singapore to shape the formal and informal (re)distribution of costs and benefits across the region. Indeed, the above discussion has described emergent governance arrangements originating from within Singapore, driven by a diversity of stakeholders interacting with each other and invested in the creation of transboundary publics, which have transcended administrative boundaries towards bridging policy gaps within the national and supranational transboundary haze governance regimes. These political non-state actors have influenced transboundary actions and outcomes through their regulatory processes, mechanisms, and organisations.

Where the Singaporean government could not enforce its extraterritorial law to hold companies accountable for haze, societal actors have adopted market-based 'naming and shaming' strategies to directly pressure companies into improving ground-level operations to prevent and suppress fires. Whereas government-to-government MoUs for haze mitigation assistance like the Singapore-Jambi MoU has been discontinued, volunteers have been able to collaborate with Indonesian NGOs and sub-national governments to facilitate peatland rehabilitation projects, albeit with varying degrees of success in various policy contexts. And where regional regulatory mechanisms proved too weak in facilitating real inter-state collaboration, Track II diplomacy has been instrumental in nudging member states towards stronger regional governance structures. The three organisations described here have thus shown how in Singapore, political power is not solely demarcated within the state space but has flowed both downwards and outwards through the efforts of Singapore's transboundary publics, and to a lesser degree, flowed upwards to legitimise state choices.

This 'devolvement' of transboundary haze governance has not always been driven by the state (Singapore). Indeed, the state has played an important role in opening up opportunities for engagement (e.g. arranging for NGO representation at ASEAN) and smoothing over faux pas (e.g. moderating the effect of media coverage of civil society activity). However, the space around transboundary haze governance has been operationalised and maintained by these transboundary publics through self-sustaining initiatives. But there is a tendency (at least in part, deliberate) for these non-state actors to continue to downplay their role: 'we ride the waves to see what's on the horizon, but when the big ship (the government) comes along, we get out of the way' (SIIA Interview, 2021). While this makes it difficult for the paper to directly correlate the groups' efforts to improvements in transboundary haze governance arrangements, the supporting interviews conducted by the author implied that those outside the group viewed their efforts as generally positive in this context (H.E.A.T. Interview, 2022; Sinar Mas Interview, 2022).

This can be understood in the context of Singapore as a depoliticised city-state, existing within the depoliticised ASEAN geopolitical region. The close, collaborative relationship between civil society and the Singaporean government has provided space for civil society to act while remaining conscious of political sensitivities within and beyond Singapore. Specific strategies reveal self-monitoring tendencies: PM Haze's 'not anti-palm oil' stance is sensitive to the fact that major palm oil companies are headquartered in Singapore, and collecting regional feedback before engaging with the transnational space reveals a deep appreciation for ASEAN's collectivist culture. It can thus be understood that the Singapore state has allowed, encouraged, and trusted its transboundary publics to move where it cannot (e.g. the suspension of APP's SGL and the SIA's direct access to leaders around the region), without the state feeling politically threatened at the national and regional level. Indeed, communication with the NEA revealed generally positive impressions of haze-focused civil society groups in Singapore: 'In the context of transboundary haze, ground-up initiatives by consumer and environmental groups can help to shift demand towards more sustainable products, incentivise companies to adopt more sustainable practices, and eventually reduce occurrences of fires and haze in the region' (NEA email communication, 2022).

However, even as these transboundary governance spaces are operationalised and maintained by transboundary publics, they are continuously in political flux, negotiated, contested, and transformed. These relationships are continuously being (re)made by the combined knowledge, technologies, funding, values and actions of jurisdictionally divided communities of resource users (Miller, 2020). The SEC continues to develop its SGL requirements to match new knowledge and political sentiment, contributing directly to the strengthening of private governance mechanisms with transboundary reach, PM Haze has fallen out of, and regained favour, in the neighbouring country where it is most active, and the SIA's relationship with the Singapore state, while always close, is complemented by its Chairperson's related positions within the government at different points in time.

In cross-border relationships, 'outside' actors may sometimes have contrasting worldviews from the situated communities and share little in common beyond their shared environmental agendas (Featherstone, 2017). These outside actors and resources can generate specific spatial forms of new social norms, often involving asymmetrical power relations, across sectors and scales of environmental governance (Miller, 2020). However, Singapore's transboundary publics were tactically and ideologically open in embracing key areas of compatibility with transboundary market agendas (Miller, Middleton, et al., 2020). SIA's flagship SDSWR platform's success in spotlighting and co-opting major corporate players and both PM Haze and SEC's approaches centred on the consumer's buying power formed the 'unifying glue' of shared economic and environmental agendas. Communities in Singapore, Indonesia, and Malaysia have thus been able to assemble around environmental solidarities (e.g., PM Haze's sustainable livelihoods approach) and mutual interests (e.g., 'pro-corporate' support for sustainable palm oil and certifiable pulp and paper) while minimising the effects of power differentials between member states. Such shared worldviews manifested through market-based strategies and fomented within the national context of a city-state, hence comfortably balancing the

internal 'Singapore Inc' (Goldstein & Pananond, 2008) interests and the regional geopolitical interests.

6 | CONCLUSIONS AND POLICY IMPLICATIONS

While ASEAN has often been critiqued as an 'elitist' organisation with limited space for non-state actors (Noortmann, 2021; Rüländ, 2014), this paper has argued how the governance approaches of Singapore's transboundary publics fit comfortably within the 'engaged non-indifference' geopolitical culture of ASEAN, whereby overtly political aspects of transboundary commoning are actively subordinated to economic strategies (Marks et al., 2020; Miller, 2020; Miller, Middleton, et al., 2020). While state strategies like the THPA, which set out to channel responsibility to the business sector while diverting the blame away from governments (Miller, Middleton, et al., 2020), failed to minimise geopolitical tensions (Varkkey, 2018), the strategies spearheaded by these non-state actors have been more successful. Most importantly, this 'democratisation' of transboundary haze governance (Rüländ, 2014) through the efforts of these transboundary publics can be positioned not as threats to the ASEAN elitist system and its national and regional institutions. Instead, it can be seen as opportunities to improve social capital, expand markets, and broadly support the ASEAN developmentalist worldview within an environmental stewardship framework.

These three interactive case studies have thus shown how subnational processes can connect, in mutually beneficial ways, with higher organisational scales of governance and interact across sectors of expertise to carve out more inclusive, informed and equitable spaces for collective decision-making over transboundary haze. By actively de-centring and limiting traditional border controls, Singapore's transboundary publics have been able to transcend hard administrative and sectoral boundaries and bridge policy gaps to address the transboundary haze issue at multiple scales (Miller, 2020; Miller, Middleton, et al., 2020). Hence, accepting that haze should be treated as both a challenge and opportunity for transboundary governance and not merely transnational governance affords consideration for the contributions of diverse corporate, state, and societal actors who function at multiple organisational scales (Marks et al., 2020). When taken together with national and supranational arrangements, these hybrid forms of governance can address the weaknesses of a particular social agent and build upon the strength of another (Lemos & Agrawal, 2006).

Hence, understanding Singapore as a robust site for transboundary haze governance contributes to the literature on how state and non-state actors can act in collaborative and complementary ways to address complex environmental issues. Additionally, making central the role of NGOs in transboundary haze governance contributes to the literature on civil society in ASEAN. While civil society has been widely understood to take a back seat within the context of ASEAN's geopolitical culture, this study adopts a power-based approach that emphasises the abilities of civil society groups to catalyse environmental change in response to social realities. It reveals how civil society can exercise power through strategic and complementary

engagement with state and market actors at multiple scales and within multiple sectors, contributing to hybrid bundles of formal and informal power relations in novel reconstitutions of resource geographies (Miller, Middleton, et al., 2020). Continuing investigations into other multi-scalar, multi-sectoral haze governance initiatives in the region, for instance, the Clean Air Network and Breathe Council in Thailand and CERAH – Anti Haze Action in Malaysia, could map out progressive ways forward to overcome existing national and supranational governance limitations and contribute to a more complete understanding of the emergent geographies of governing mobile air commons in Southeast Asia.

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REFERENCES

- Alfajri, A., Setiawan, A., Varkkey, H., Ashfold, M., De Pretto, L., Wong, P. Y., & Ives, C. (2021). Can religious values be a source of hope in tackling the southeast Asian haze crisis? *Yale Forum on Religion and Ecology*. <https://fore.yale.edu/blogs/entry/1615472611>
- Angela, J., & Hikam, M. A. S. (2019). The contribution of NGO in public diplomacy: A case study of the Singapore Institute of International Affairs in resolving the transboundary Haze pollution issue between Singapore-Indonesia (2012-2016). *AEGIS: Journal of International Relations*, 3(2), 146–168. <https://doi.org/10.33021/aegis.v3i2.725>
- AsiaOne. (2016). Haze cost Singapore estimated \$700m last year: Minister Masagos. *AsiaOne, EarthOne*.
- Astuti, R. (2020). Fixing flammable Forest: The scalar politics of peatland governance and restoration in Indonesia. *Asia Pacific Viewpoint*, 61(2), 283–300. <https://doi.org/10.1111/apv.12267>
- Aviel, J. A. F. (2000). Placing human rights and environmental issues on Asean's agenda: The role of non-governmental organisations. *Asian Journal of Political Science*, 8(2), 17–34. <https://doi.org/10.1080/02185370008434168>
- Balakrishnan, V. (2014). Keynote Speech. In *Singapore Dialogue on Sustainable World Resources*. National Archives of Singapore. https://www.nas.gov.sg/archivesonline/data/pdfdoc/MSE_20140520001.pdf
- Bassano, M., & Tan, D. (2014). Dissecting the transboundary haze pollution bill of Singapore. *Columbia School of International and Public Affairs*.
- BBC. (2013). Singapore haze hits record high from Indonesia fires. *BBC News, Asia*. <https://www.bbc.com/news/world-asia-22998592>
- Brenner, N. (2001). The limits to scale? Methodological reflections on scalar structuration. *Progress in Human Geography*, 25(4), 591–614. <https://doi.org/10.1191/030913201682688959>
- Bulkeley, H. (2005). Reconfiguring environmental governance: Towards a politics of scales and networks. *Political Geography*, 24(8), 875–902. <https://doi.org/10.1016/j.polgeo.2005.07.002>
- Caballero-Anthony, M. (2018). ASEAN's track two diplomacy: Reconstructing regional mechanisms of conflict management. In *Regional Security in Southeast Asia* (Vol. 5, pp. 157–193). De Gruyter. <https://doi.org/10.1355/9789812307095-007>
- Chander, P. (2017). A political economy analysis of the southeast Asian Haze and some solutions (No. 303; Issue 303).
- Chin, J. (2016). The 2015 Singapore swing: Depoliticised polity and the Kiasi/Kiasu voter. *Round Table*, 105(2), 141–148. <https://doi.org/10.1080/00358533.2016.1154383>
- Cotton, J. (1999). The “haze” over Southeast Asia: Challenging the ASEAN mode of regional engagement. *Pacific Affairs*, 72(3), 331–351. <https://doi.org/10.2307/2672225>
- Featherstone, D. (2017). Spatialities of transnational resistance to globalisation: The maps of grievance of the inter-continental caravan. In S. Corbridge, (Ed.), *Development: Critical Essays in Human Geography* (1st ed., pp. 431–448). Routledge. <https://doi.org/10.4324/9781315258027-22>
- Fitria, S. (2022). PM Haze dan EKA Tutup Tahun 2021 dengan Perbaikan Sekat Kenal. *Singkapinfo.com*. <https://sinkap.info/2022/01/pm-hazedan-ekatutup-tahun-2021-dengan-perbaikan-sekat-kenal/>
- Florano, E. R. (2003). Assessment of the “strengths” of the new ASEAN agreement on transboundary Haze pollution. *International Review for Environmental Strategies*, 4, 127–147.
- Florano, E. R. (2004). The case of the Asean regional Haze action plan. *International Environmental Governance Conference*, March, 1, 1–13.
- Francesch-Huidobro, M. (2008). The power of circumvention: Fighting the southeast Asian Forest fires and haze. In *Governance, politics and the environment: A Singapore study* (pp. 245–281). ISEAS.
- Ghosh, R., Wolf, S., Wyborn, C., Bixler, R. P., Hudalah, D., Firman, T., Hong, R. N., Pye, O., Bäckstrand, K., Miller, M. A., Marks, D., Miller, M. A., Vassanadumrongdee, S., Middleton, C., Rigg, J., Taylor, D., Klinke, A., Koontz, T. M., Newig, J., ... Koh, L. P. (2020). The “Haze” crisis in Southeast Asia: Assessing Singapore's transboundary Haze pollution act 2014. *Asia Pacific Viewpoint*, 61(2), 1–44. <https://doi.org/10.2139/ssrn.2547379>
- Goldstein, A., & Pananond, P. (2008). Singapore Inc. goes shopping abroad: Profits and pitfalls. *Journal of Contemporary Asia*, 38(3), 417–438. <https://doi.org/10.1080/00472330802078493>
- Gopesisir.com. (2020). PM HAZE Dan LSM EKA Lakukan Restorasi Gambut Dan Pertanian. *Gopesisir.com*. <https://www.gopesisir.com/berita/2020/10/pm-haze-dan-lsm-eka-lakukan-restorasi-gambut-danpertanian>
- H.E.A.T. Interview. (2022). 24 February 2022.
- Heilmann, D. (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. <https://doi.org/10.1177/186810341503400304>
- Hicks, R. (2019, June 4). Could haze-linked paper giant APP return to supermarkets in Singapore? *Eco-Business*. <https://www.eco-business.com/news/could-haze-linked-paper-giant-app-return-to-supermarketsin-singapore/>
- Hirsch, P. (2020). Scaling the environmental commons: Broadening our frame of reference for transboundary governance in Southeast Asia. *Asia Pacific Viewpoint*, 61(2), 190–202. <https://doi.org/10.1111/apv.12253>
- Hong, D. (2017). Exploring informal social & cultural activism in Singapore: A study on local ground-up initiatives. (Working Paper). ISEAS Yusof Ishak Institute. <http://hdl.handle.net/11540/7941>
- Hong, R. N. (2016). Singapore's transboundary haze pollution act and the shield of sovereignty in Southeast Asia. *Singapore Law Journal*, 34, 103–138.
- Hurley, A., & Lee, T. (2020). Delayed ratification in environmental regimes: Indonesia's ratification of the ASEAN agreement on transboundary haze

- pollution. *Pacific Review*, 34(6), 1–30. <https://doi.org/10.1080/09512748.2020.1801816>
- Ives, C., Liu, F., Varkkey, H., De Pretto, L., Ashfold, M., Miller, M. A., Kumar, P. V., Astuti, R., Masran, S. A., & Wong, P. Y. (2020). Public values and sentiments regarding transboundary haze pollution in Singapore. *ARIScope*. <https://ari.nus.edu.sg/ariscope/public-valuesand-sentiments-regarding-transboundary-haze-pollution-in-singapore/>
- Jerger, D. B. (2014). Indonesia's role in Realising the goals of ASEAN's agreement on transboundary Haze pollution. *Sustainable Development Law & Policy*, 14(1), 35–45. <http://digitalcommons.wcl.american.edu/sdlp>
- Jones, D. S. (2004). ASEAN initiatives to combat Haze pollution: An assessment of regional cooperation in public policy-making. *Asian Journal of Political Science*, 12(2), 59–77. <https://doi.org/10.1080/02185370408434242>
- Jordan, L., & van Tuijl, P. (2012). *NGO accountability: Politics, principles and innovations* (pp. 1–257). Routledge. <https://doi.org/10.4324/9781849772099>
- Karim, M. S. (2008). Future of the haze agreement - is the glass half empty or half full? *Environmental Policy and Law*, 38(6), 328–334.
- Karkkainen, B. (2004). Post-sovereign environmental governance. *Global Environmental Politics*, 4(1), 72–96.
- Khaw, C. (2016). "Zero chance" of haze like last year in Singapore and region, says Indonesian official. *Straits Times*. <https://www.straitstimes.com/singapore/environment/zero-chance-of-haze-like-last-year-in-singapore-and-region-says-indonesian>
- Kiely, L., Spracklen, D. V., Wiedinmyer, C., Conibear, L., Reddington, C. L., Arnold, S. R., Knote, C., Khan, M. F., Latif, M. T., Syaufina, L., & Adrianto, H. A. (2020). Air quality and health impacts of vegetation and peat fires in equatorial Asia during 2004–2015. *Environmental Research Letters*, 15(9), 1–12. <https://doi.org/10.1088/17489326/ab9a6c>
- Kopplitz, S. N., Jacob, D. J., Schwartz, J., Myers, S. S., Liu, T., Pongsiri, M., Buonocore, J. J., Marlier, M. E., DeFries, R. S., Mickley, L. J., Kim, P. S., & Sulprizio, M. P. (2016). Public health impacts of the severe haze in equatorial Asia in September–October 2015: Demonstration of a new framework for informing fire management strategies to reduce downwind smoke exposure. *Environmental Research Letters*, 11(9), 094023. <https://doi.org/10.1088/1748-9326/11/9/094023>
- Kraft, H. J. S. (2000). The autonomy dilemma of track two diplomacy in Southeast Asia. *Security Dialogue*, 31(3), 343–356.
- Latif, M. T., Othman, M., Idris, N., Juneng, L., Abdullah, A. M., Hamzah, W. P., Khan, M. F., Nik Sulaiman, N. M., Jewaratnam, J., Aghamohammadi, N., Sahani, M., Xiang, C. J., Ahamad, F., Amil, N., Darus, M., Varkkey, H., Tangang, F., & Jaafar, A. B. (2018). Impact of regional haze towards air quality in Malaysia: A review. *Atmospheric Environment*, 177(January), 28–44. <https://doi.org/10.1016/j.atmosenv.2018.01.002>
- Lee, J. S. H., Jaafar, Z., Tan, A. K. J., Carrasco, L. R., Ewing, J. J., Bickford, D. P., Webb, E. L., & Koh, L. P. (2016). Toward clearer skies: Challenges in regulating transboundary haze in Southeast Asia. *Environmental Science and Policy*, 55, 87–95. <https://doi.org/10.1016/j.envsci.2015.09.008>
- Lemos, M. C., & Agrawal, A. (2006). Environmental governance. *Annual Review of Environment and Resources*, 31(1), 297–325. <https://doi.org/10.1146/annurev.energy.31.042605.135621>
- Lim, J. (2013). Singapore will push for accurate land concession maps at Asean meeting: Dr Balakrishnan. *Straits Times*. <https://www.straitstimes.com/singapore/singapore-will-push-for-accurate-landconcession-maps-at-asean-meeting-dr-balakrishnan>
- Marks, D., Miller, M. A., & Vassanadumrongdee, S. (2020). The geopolitical economy of Thailand's marine plastic pollution crisis. *Asia Pacific Viewpoint*, 61(2), 266–282. <https://doi.org/10.1111/apv.12255>
- Miller, M. A. (2020). B/ordering the environmental commons. *Progress in Human Geography*, 44(3), 473–491. <https://doi.org/10.1177/0309132519837814>
- Miller, M. A. (2021). Market-based commons: Social agroforestry, fire mitigation strategies, and green supply chains in Indonesia's peatlands. *Transactions of the Institute of British Geographers*, 47, 77–91. <https://doi.org/10.1111/tran.12472>
- Miller, M. A., Middleton, C., Rigg, J., & Taylor, D. (2020). Hybrid governance of transboundary commons: Insights from Southeast Asia. *Annals of the American Association of Geographers*, 110(1), 297–313. <https://doi.org/10.1080/24694452.2019.1624148>
- Miller, M. A., Rigg, J., & Taylor, D. (2020). Governing transboundary commons in Southeast Asia. *Asia Pacific Viewpoint*, 61(2), 185–189. <https://doi.org/10.1111/apv.12285>
- Ministry of Law (2021). Oral answer by minister for foreign affairs and law. In K Shanmugam to Parliamentary Questions on the haze. Ministry of Law. <https://www.mlaw.gov.sg/news/parliamentary-speeches/oralanswer-pqs-on-haze>
- Morada, N. M. (2007). APA and track 2½ diplomacy: The role of the ASEAN People's assembly in building an ASEAN community. In *Ideas and Institutions: Building an ASEAN Community* (Vol. 2002, pp. 1–8). RSIS.
- Mursitama, T. N. (2012). Second track diplomacy in ASEAN + 3: The case of Indonesia and Network of East Asian Think-Tanks (NEAT). *International Affairs and Global Strategy*, 5, 5–10.
- Hamilton-Hart, N. (2009). Indonesia and Singapore: Structure, politics and interests. *Contemporary Southeast Asia*, 31(2), 249. <https://doi.org/10.1355/cs31-2c>
- NEA. (2022). About us. <https://www.nea.gov.sg/corporate-functions/whoweare/about-us>
- NEA email communication. (2022). 17 March 2022.
- Nesadurai, H. (2017). ASEAN Environmental Cooperation, Transnational Private Governance, and the Haze: Overcoming the 'Territorial Trap' of State-Based Governance? *TRaNS: Trans-Regional and -National Studies of Southeast Asia*, 121–141.
- Nguitragool, P. (2010). *Environmental cooperation in Southeast Asia: ASEAN's regime for transboundary Haze pollution*. Routledge.
- Nguitragool, P. (2011). 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. <https://doi.org/10.1525/AS.2011.51.2.356>
- Noortmann, M. (2021). ASEAN and its people: Regional internationalism and the politics of exclusion. In *Foreign policies and diplomacies in Asia*. Cambridge University Press. <https://doi.org/10.1017/9789048519101.005>
- Nurhidayah, L., Alam, S., & Lipman, Z. (2015). The influence of international law upon ASEAN approaches in addressing transboundary haze pollution in Southeast Asia. *Contemporary Southeast Asia*, 37(2), 183–210. <https://doi.org/10.1355/cs37-2b>
- Oh, T. (2019). Battling the haze: Singaporean joins the fight against peatland fires in Riau. *Today*. <https://www.todayonline.com/singapore/battlinghaze-singaporean-joins-fight-against-peatland-fires-riau>
- Padfield, R., Drew, S., Sayuti, K., Page, S., Evers, S., Campos-Arceiz, A., Kangayatarasu, N., Sayok, A., Hansen, S., Schouten, G., Maulidia, M., Papargyropoulou, E., & Tham, M. H. (2016). Landscapes in transition: An analysis of sustainable policy initiatives and emerging corporate commitments in the palm oil industry. *Landscape Research*, 41(7), 744–756. <https://doi.org/10.1080/01426397.2016.1173660>
- Palanissamy, A. (2013). Haze free air in Singapore and Malaysia – The Spirit of the law in South East Asia. *International Journal of Education and Research*, 1(8), 1–8.
- Pangarkar, N., & Lim, H. (2003). Performance of foreign direct investment from Singapore. *International Business Review*, 12(5), 601–624. [https://doi.org/10.1016/S0969-5931\(03\)00078-7](https://doi.org/10.1016/S0969-5931(03)00078-7)
- Pelling, M. (2011). *Adaptation to climate change: From resilience to transformation*. Routledge.

- PM Haze. (2016). Annual Report 2016.
- PM Haze. (2018a). Annual Report 2018. 2018.
- PM Haze (2018b). How Singapore can help stop haze: The palm oil factor. In E. Quah & T. S. Tan (Eds.), *Pollution across Borders: Transboundary fire, smoke and Haze in Southeast Asia* (pp. 137–170). World Scientific. https://doi.org/10.1142/9789813203921_0014 PM
- Haze. (2019). Annual Report 2019.
- PM Haze Interview. (2021). 22 September 2021.
- Pramudya, E. P., Hospes, O., & Termeer, C. J. A. M. (2018). Friend or foe? The various responses of the Indonesian state to sustainable non-state palm oil initiatives. *Asian Journal of Sustainability and Social Responsibility*, 3(1), 1–22. <https://doi.org/10.1186/s41180-018-0018-y>
- Pye, O. (2010). The biofuel connection - transnational activism and the palm oil boom. *Journal of Peasant Studies*, 37(4), 851–874. <https://doi.org/10.1080/03066150.2010.512461>
- Quah, E., & Chia, W. M. (2019). What the 2015 haze cost Singapore: S\$1.83 billion (Vol. A16). *The Straits Times*.
- Rabiul Islam, M. F. I., & K. A. K. (2020). The role of international political economy on transboundary haze: A comparison study among Malaysia, Indonesia and Singapore. *International Journal of Management*, 11(7), 443–452. <https://doi.org/10.34218/IJM.11.7.2020.042>
- Raymond, J. (2018). Partnerships and long-term solutions will be critical. In E. Quah & T. S. Tan (Eds.), *Pollution across Borders: Transboundary fire, smoke and Haze in Southeast Asia* (pp. 171–175). World Scientific. https://doi.org/10.1142/9789813203921_0015
- Reyes, E. (2013). Legislate penalties for firms responsible for haze: SIAA. *EcoBusiness*. <https://www.eco-business.com/news/legislate-penalties-firms-responsible-haze-siaa/?sw-signup=true>
- Rhodes, R. (1996). The new governance: Governing without government. *Political Studies*, XLIV, 652e667; *Political Studies*, XLIV, 652–667.
- Riauin.com. (2021). Peringati Hari Bumi 2021 PM Haze dan Lembaga EKA: Bumi Adalah Rumah Kita. Riauin.com. <https://www.riauin.com/news/cetak/24355>
- Riautempo.com. (2020). EKA dan PM Haze Fokus Pemeliharaan Pohon Sebelum Musim Kemarau Datang. Riautempo.com. <https://www.riautempo.com/read-510-462-2020-01-29-eka-dan-pm-haze-fokus-pemeliharaan-pohon-sebelum-musim-kemarau-datang.html>
- Rüland, J. (2014). The limits of democratising interest representation: ASEAN's regional corporatism and normative challenges. *European Journal of International Relations*, 20(1), 237–261. <https://doi.org/10.1177/1354066112445289>
- SEC. (2021a). About Singapore green labelling scheme. Singapore environment council. https://sgls.sec.org.sg/cms.php?cms_id=3
- SEC. (2021b). Overview. Singapore Environment Council. <https://sec.org.sg/about-us/overview/>
- SEC, & CASE. (2015). Press Release: SEC and CASE step up engagement efforts by getting leading supermarkets, pharmacies, furniture retailers to declare that their wood, paper and/or pulp materials are procured from sustainable (Issue October). Singapore Environment Council.
- Siddiqui, A. I. (2018). Can responsible corporate behavior clean up the haze? In E. Quah & T. S. Tan (Eds.), *Pollution across borders: Transboundary fire, smoke and Haze in Southeast Asia* (pp. 225–235). World Scientific. https://doi.org/10.1142/9789813203921_0018
- SIIA (2019). ASEAN's pathway to sustainability: Targets for 2020 and beyond. In 6th Singapore Dialogue on Sustainable World Resources, May 2019. Singapore Institute of International Affairs.
- SIIA. (2021a). About us. Singapore Institute of International Affairs. <http://www.siaonline.org/about-us/>
- SIIA. (2021b). Our network. Singapore Institute of International Affairs. <http://www.siaonline.org/our-network/> SIIA
- Interview. (2021). 21 September 2021.
- Sinar Mas Interview. (2022). 22 February 2022.
- Singapore Exchange Limited. (2021). Climate Impact X. Singapore Exchange Limited. <https://www.sgx.com/climate-impact-x-cix>
- Sunchindah, A. (2015). Transboundary Haze pollution problem in Southeast Asia: Reframing ASEAN's response. In ERIA Discussion Papers Series, December (82) (pp. 1–21). Economic Research Institute for ASEAN and East Asia. <http://www.eria.org/ERIA-DP-2015-59.pdf>
- Tan, A. (2015a). The 2015 game changer. In E. Quah & T. S. Tan (Eds.), *Pollution across Borders: Transboundary fire, smoke and Haze in Southeast Asia* (pp. 291–296). World Scientific.
- Tan, A. K.-J. (2005). The ASEAN agreement on transboundary Haze pollution: Prospects for compliance and effectiveness in post-Suharto Indonesia. *New York University Environmental Law Journal*, 13, 647–772.
- Tan, A. K.-J. (2015b). The “Haze” crisis in Southeast Asia: Assessing Singapore's Transboundary haze Pollution Act 2014. In NUS law working paper series (Issue January 2014). NUS Law. <https://doi.org/10.2139/ssrn.2547379>
- Tan, E. K. B. (2018). Battling the haze of cross-boundary (mis)governance in transboundary air pollution: A perspective from Singapore. In *Pollution across borders: Transboundary fire, smoke and Haze in Southeast Asia* (pp. 279–289). World Scientific. https://doi.org/10.1142/9789813203921_0022
- Taylor, M. (2019). Singaporeans head to fire hotspot village in Indonesia to tackle haze. Reuters. <https://www.reuters.com/article/us-singaporehaze-forests-idUSKCN1UD2HB>
- The Sun. (2016). Haze MoU discontinued, says minister. *The Sun*.
- Tis. (2020). Tahun 2020 LSM EKA dan PM Haze Perluas Lokasi Restorasi. Riaumadani.com. <https://www.riaumadani.com/read-8734-2020-0128-tahun-2020-lsm-eka-dan-pm-haze-perluas-lokasi-restorasi.html>
- Today. (2013). New haze monitoring system approved at ASEAN summit. *Today*. <https://www.todayonline.com/singapore/new-haze-monitoring-system-approved-asean-summit>
- TODAY. (2015). Asia Pulp & Paper hit by another company withdrawal. TODAY.
- Transboundary Haze Pollution Act. (2014). Transboundary Haze Pollution Act. <https://sso.agc.gov.sg/Act/THPA2014>
- Varkkey, H. (2011). Addressing transboundary Haze through Asean: Singapore's normative constraints. *Journal of International Studies*, 7, 83–101. <https://doi.org/10.32890/jis.7.2011.7918>
- Varkkey, H. (2014). Regional cooperation, patronage and the ASEAN agreement on transboundary haze pollution. *International Environmental Agreements: Politics, Law and Economics*, 14(1), 65–81. <https://doi.org/10.1007/s10784-013-9217-2>
- Varkkey, H. (2016). The Haze problem in Southeast Asia: Palm oil and patronage. Routledge.
- Varkkey, H. (2018). Revisiting the “Myth” of the ASEAN way: Recent legal development on transboundary Haze. *Indonesian Journal of International Law*, 15(4), 553–579.
- Wijedasa, L. S., Posa, M. R. C., & Clements, G. R. (2015). Peat fires: Emissions likely to worsen. *Nature*, 527(7578), 305. <https://doi.org/10.1038/527305a>
- Wong, P. Y., Varkkey, H., Ashfold, M., De Pretto, L., Ives, C., Masran, S. A., & Kumar, P. V. (2020). Malaysia's role in transboundary Haze pollution: Reconciling policy with public and consumer values. *TECSEA Blog*. <https://www.tecsea.info/post/malaysia-s-role-in-transboundary-haze-pollution-reconciling-policy-with-public-and-consumer-values>
- Woo, S. B. (2013). Haze meeting: Govts agree to share concession maps. *Today*. <https://www.todayonline.com/singapore/haze-meeting-govts-agree-share-concession-maps>
- World Bank Group. (2009). What is governance? Public Sector Development. https://web.worldbank.org/archive/website01020/WEB/0__CON-5.HTM
- Young, O. (1997). Rights, rules and resources in world affairs. In O. Young (Ed.), *Global governance: Drawing insights from the environmental experience* (pp. 1–23). MIT.

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