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# TRANSBOUNDARY HAZE IN SOUTHEAST ASIA: CHALLENGES AND PATHWAYS FORWARD

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***Transboundary haze has had wide-ranging impacts in Southeast Asia, on public health, tourism, biodiversity and national economies. In tackling this problem, important questions exist about the trajectory of haze trends in the context of a changing climate and of shifting conditions on the ground in Indonesia. This NTS Alert reviews leading knowledge on these points, and explores pathways for tackling the haze issue in the face of the seeming ineffectiveness of ASEAN-level mechanisms.***

*Forest burning in Indonesia is a major cause of haze events such as this one in Singapore in October 2005.*
*Credit*: asiabruin / flickr.

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## Introduction

The Singapore National Environment Agency announced in late August that it will implement a range of new measures to improve national air quality standards by 2020. These measures largely concern domestic sources of air pollution such as transportation and industry, but will also address international causes of poor air quality including transboundary haze (NEA, 2012). There will be greater monitoring and measuring of haze, as well as more effective ways of alerting the populace to haze levels. Such developments make it apt to re-evaluate the transboundary haze issue, revisiting its primary causes and asking questions about how affected countries might be able to influence its trajectory.

- **Consortium of NTS Studies in Asia Website**
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Discussions of haze quickly necessitate a focus on weather conditions, and in Southeast Asia as elsewhere, weather conditions are changing. Regional El Niño dynamics are related strongly to the propagation and distribution of haze, and uncertainties abound regarding how climate change is affecting El Niño cycles and might amplify or otherwise affect haze challenges. This paper reviews leading knowledge on these points and argues that both climate and El Niño are increasingly relevant to the nature of the haze issue, but that the crux of any effort to combat transboundary haze remains on the ground in Indonesia.

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## Causes in brief

A sporadic problem for decades, transboundary haze became a key concern in Southeast Asia following a major episode in 1997–1998 that was recognised as 'one of the most damaging environmental catastrophes in recorded history' (Hamzah, 2012, pp. 141–2; see also Cotton, 1999). That haze episode, and others since, had significant impacts on public health, biodiversity, tourism and national economies in the region (Quah, 2002; Tacconi, 2003; Jones, 2006). What though are the factors behind the annual haze episodes and the severity of the problem?

### Severe haze, a recurring regional issue

Forest fires in Indonesia, notably those originating from the islands of Sumatra and Kalimantan, are the primary cause of haze events in the region (Mayer, 2006). The haze events of the late 1990s resulted from a convergence of political, economic and environmental conditions favourable to land clearance (Hansen et al., 2009). More specifically, evidence suggests that oil palm interests took advantage of conducive climate conditions to clear land through burning, contributing to the loss of nearly 5 million hectares of forest and blanketing the region with haze (UN-Habitat, 2000; Hansen et al., 2009). Since then, haze has affected the region on a regular basis: in 2001, 2002, 2003, 2006 and from 2009 onwards (Hamzah, 2012).

### Escalation of forest burning in Indonesia

Forest-clearing fires typically occur during the annual dry season from June to September. Traditionally, they were set by small-scale landholders to rejuvenate soil after harvest and to make land available for agriculture. In recent decades, however, the potential economic and financial benefits from timber and the production of commodities such as palm oil have seen larger logging companies and plantation owners in Indonesia come to account for a major part of such deforestation.

Much of the deforestation by large-scale concerns has occurred in the lowlands of Sumatra and Kalimantan. These two areas experienced an annual forest loss of almost 3.5 per cent during the 1990s. Between 1990 and 2005, over 40 per cent of their forest cover was lost (Hansen et al., 2009). After a short-lived reduction in forest clearing during the economically lean years of 1999–2000, forest-clearing rates again increased, in part as a response to price increases for oil palm and other land-based commodities (Hansen et al., 2009).

It is difficult at present to determine exact ratios of small- versus large-scale forest clearance, as many small-scale cultivators change locations frequently and are not picked up in official government statistics. Moreover, the lines between small and large actors can be blurred by the fact that leases held by small-scale landholders are often contracted to corporate enterprises to grow crops such as oil palm (Ewing, 2011). However, it is clear that significant, powerful interests continue to play the dominant role in haze-producing clearing activities in relation to local slash-and-burn agricultural strategies (Hamzah, 2012).

Furthermore, significant levels of burning look set to continue, as that method tends to be chosen over other land-clearing practices both by small-scale landholders and larger entities alike. This preference reflects cultural norms as well as a lack of viable and affordable alternatives. Burning is quick and efficient, requires minimal labour, helps control pests and diseases, assists in plant matter decomposition and aids soil health. Emergent climatic changes could exacerbate these already problematic conditions.

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*The burning of peatland causes more greenhouse gas emissions than the burning of other types of forested areas, and the continued underground burning of plant matter beneath the earth's surface can last for months.*

*Credit*: CIFOR / flickr.

## El Niño, climate change and burning: Critical interactions

The locations and scale of haze impacts depend on several key factors, including the extent of the fires, the strength and direction of prevailing winds, and the incidence and amount of rain. An understanding of current environmental conditions, and how these may shift in the coming decades, is therefore an essential component in developing appropriate and effective strategies to address the haze problem.

The correlation between the occurrence and severity of haze and the El Niño phenomenon is well documented (Murdiyarso et al., 2002; Tacconi, 2003; Florano, 2004; Herawati and Santoso, 2011). El Niño contributes to dry conditions and decreases in rainfall, and these conditions allow fires to start and spread more easily and thus influence the scale and impacts of the annual fires. The relevance of El Niño cycles is further demonstrated by the conjunction of such cycles in 1997–1998 and 2006 with major haze events.

There are indications that climate change may influence the frequency and severity of the El Niño effect (Herawati and Santoso, 2011). At this stage, however, the Intergovernmental Panel on Climate Change (IPCC) is unable to express confident understanding of the relationship between climate change and El Niño, due in part to the difficulty of measuring possible linkages (IPCC, 2012; Stevenson et al., 2012). Despite the absence of scientific consensus on the links between climate change and El Niño, this environmental phenomenon appears to have undergone certain shifts over the past decades. In particular, it seems to be occurring more frequently (NOAA, 2010). On a more general level, climate change is likely to have significant impacts on both the incidence and duration of forest fires and haze. Climate change effects include warmer temperatures and variations in rainfall patterns and, like El Niño, these changes in environmental conditions are likely to allow fires to start and spread more easily.

Additionally, climate change can be affected by forest fires. When occurring on a sufficiently large scale, forest burning exhibits a vicious cycle of partially climate-induced fires emitting climate-change causing greenhouse gases. In Indonesia, the burning of forested and peatland areas releases significant levels of carbon dioxide while destroying carbon sinks. Peatland in particular, being composed of dense, partly decomposed plant matter, and being often drained as part of land clearing for agricultural expansion, provides conditions conducive to extensive burning. Peatland fires are very difficult to suppress, often continuing to burn underground months after the fires have seemingly been extinguished. They also release far more carbon dioxide than the burning of more conventional forestland (ASEAN, 2011). For most countries, these issues are negligible parts of the overall emissions equation, but the scale of Indonesia's forests and peatlands means that years of forest harvesting and clearing have had emissions implications that are significant to the composition of the global atmosphere. This adds an additional element to political efforts, both inside and outside of Indonesia, to impact forest-clearing practices in the country.

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## The politics of haze: ASEAN limitations, Indonesian intractability

### ASEAN Agreement on Transboundary Haze Pollution

The transboundary nature of the haze issue has long brought it to the attention of regional forums. ASEAN has collaborated on this issue since 1990 (Jones, 2006), developing various voluntary efforts to prevent, mitigate and monitor deforestation activities in the region, particularly in Indonesia. It was the disastrous impacts of the 1997–1998 haze, however, that placed transboundary haze firmly on ASEAN's agenda, and led to the Agreement on Transboundary Haze Pollution (ASEAN, 2002).

The Agreement, adopted in 2002 and coming into force in 2003, was a notable step away from ASEAN's non-interventionist bent (Nguitragool, 2011). It outlined the ambitious task of drastically reducing forest fires through a legally binding agreement. In years since, haze has remained on the ASEAN agenda and is listed as one of ten 'priority areas' for ASEAN environmental cooperation in the blueprint for the ASEAN Socio-Cultural Community 2009–2015 (ASEAN, 2009).

However, despite strong rhetoric and signs of commitment, effective action through the ASEAN platform has remained largely absent. Several key reasons for ASEAN's ineffectiveness stand out. First, and of central importance, is that Indonesia has yet to ratify the Agreement.

With the fires in Indonesia the primary cause of the haze problem, Indonesia's position remains an obvious barrier to meaningful action. Second, the Agreement is weakened by mechanisms that support the non-intervention norm. Assistance, for example, can only be given by mutual consent, and is subject to the direction and control of the recipient state. While this is important for keeping the consensus-oriented approach of ASEAN at the fore, it creates difficulties in finding pragmatic solutions to the haze problem. Indonesia, for example, has in the past denied assistance presumably for sovereignty or reputational reasons (Satriastanti, 2011). Third, despite the legally binding nature of the Agreement, there is little scope for accountability or enforceability. This is amplified by the fact that there are no mechanisms for sanctions or dispute settlement, and no monitoring mechanisms. In short, ASEAN has limited organisational capacity to truly combat the challenges posed.

### Indonesia's capacity challenges

Such regional-level difficulties are exacerbated by Indonesia's lack of capacity and/or willingness to address forest burning and haze through national policy development or good-faith regional engagement. Moreover, it has been argued that even if Indonesia were to ratify the ASEAN Agreement on Transboundary Haze Pollution, it might make little practical difference on the ground given that the country faces multiple challenges in implementation (Tan, 2005). These include:

*A leading cause of deforestation is the profit potential of crops such as palm oil. This image shows an oil palm plantation bordering intact forest in Jambi province, Indonesia.*

*Credit*: CIFOR / flickr.

- *Economic and financial drivers.* Indonesia has long experienced problems with corruption, and the financial incentives to continue clearing forests are very real. As noted earlier, forest burning is increasingly conducted to clear land for the production of lucrative commodities, notably timber, palm products and rubber. These products contribute significantly to Indonesia's gross domestic product (GDP), and the demand for them is growing (Ewing, 2011). These financial benefits are often accorded greater priority than the national and regional impacts on populations and economies.
- *Geographical difficulties.* Even if the desire to develop strict deforestation policies existed, Indonesia's geography would constrain its capacity for effective policy implementation and enforcement. The sheer size of forested areas, the sprawling archipelagic nature of the country and the difficulty in monitoring forestry activities from the ground are barriers that will not dissipate.
- *Legal shortcomings.* Insufficient legal frameworks also impact Indonesia's capacity for effective action to minimise forest fires. Creating policies will have little impact if appropriate legal action cannot be taken or enforced.

Such dynamics mean that for externally affected countries such as Singapore and Malaysia, reducing the prevalence and volumes of transboundary haze continues to be logistically problematic. There are, nevertheless, some pathways that could be explored or scaled up.

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## Pathways for the region

Innovative approaches are needed both to prepare for future haze events and to address the processes that are driving forest fires. Approaches should aim to increase understanding of how the trajectory of the haze is likely to change over the coming years, as well as how regional actors can engage with Indonesia more effectively.

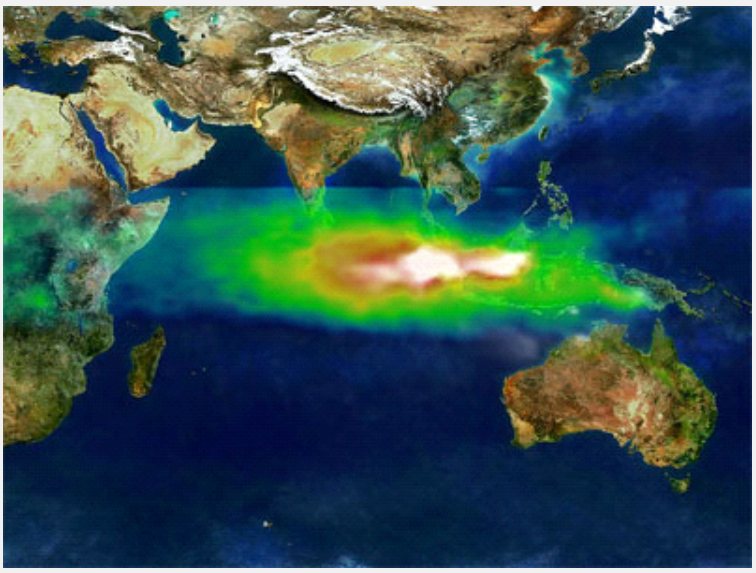
### Climate research

Understanding the role of El Niño and climate change is significant for the development of policies to address the haze problem. Singapore, as a leader in regional climate change research, is well positioned to play a central role here. In particular, targeted studies about the relevance of climate change for El Niño periods and haze trends and events would be welcome contributions.

### Bilateral and regional cooperation

Haze represents a clear case of transboundary pollution inflicted on Indonesia's neighbours through little or no fault of their own. As such, there are international legal and normative foundations for framing and adjudicating haze as an infringement of sovereignty and rights (Nurhidayah, 2012). The practical applications of such frameworks are not readily apparent however; and appear on the surface to be anathema to Southeast Asia's diplomatic culture. From the earlier discussion, it is clear that the consensus-oriented approach favoured by ASEAN has been at least partially responsible for the slow regional progress on the haze issue. The region has consistently avoided establishing liability regimes or formal punitive instruments directed at polluting countries (Koh and Robinson, 2002), opting instead for

prevention strategies that have often been found wanting. Nevertheless, the extent of the negative ramifications of fires and haze for Indonesia and the wider region indicates the need to doggedly pursue solutions to the problem.



*This image taken on 22 October 1997 shows haze (in green, yellow and red) being carried by high-altitude winds from areas near fires (white).*
*Credit*: SEWilco / Wikimedia Commons.

There are cooperative precedents to this end, with Singapore and Indonesia creating collaborative partnerships in the wake of meetings in 2006, and Malaysia and Indonesia signing a memorandum of understanding in 2008. These agreements have helped facilitate the use of funds and resources from neighbouring countries to address the root causes of the haze problems in high-risk areas such as Riau and Jambi. Specifically, these efforts have led to training and information sharing on zero-burning techniques for farmers, fire-fighting improvements, better management of peatlands, and more robust air quality monitoring. Given the wide-ranging impacts of the haze and the likelihood of natural conditions enabling more forest burning, these efforts should be evaluated with the possibility of scaling-up their more successful components.

Indonesia also remains engaged in ASEAN processes despite its failure to ratify the Agreement on Transboundary Haze Pollution. Ministers from Singapore, Malaysia, Brunei and Thailand praised Indonesia at an ASEAN forum in May 2012 for reducing haze hot spots and for its greenhouse gas emissions targets (ASEAN, 2012). While these forums have failed to overcome haze problems, they provide a platform for regional diplomatic pressure and the fermentation of innovative cooperative strategies to combat haze.

### Forest preservation programmes

There are also possibilities for mitigating haze through contributing to forest preservation programmes such as Reducing Emissions from Deforestation and Forest Degradation Plus (REDD+). REDD+ initiatives have been piloted and are ongoing in Jambi and other haze-producing regions of Indonesia. One of the key goals of REDD+ is to create incentive programmes that make forests more valuable standing than if they were to be cleared for agricultural activities. Many questions remain regarding REDD+ possibilities in Indonesia (Ewing, 2011), but it is clear that in principle such carbon-sink related funding could counter the attractiveness of the potential profits to be gained from clearing forest land for agriculture or timber. Already there is significant REDD+ funding allocated to Indonesia through the financial channels of the UN Framework Convention on Climate Change (UNFCCC), and from countries such as Norway and Australia. Singapore could partner with other countries affected by the haze to encourage Indonesia and other actors in the REDD+ programmes there to target areas for protection that are haze risks.

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## Conclusion

This NTS Alert suggests that while changing climate conditions may be increasing in relevance, improvements in the annual transboundary haze problem still lie in reducing forest burning in Indonesia; and Indonesia itself needs to play a central role in driving this. Unfortunately, this is a task that Indonesia appears to be as yet unable or unwilling to prioritise. Overcoming the formidable financial incentives that lie behind the forest burning is crucial for effecting changes in Indonesia's position on the haze issue. In this respect, there are signs that the balance may be slowly shifting. There appears to be a growing willingness on the part of Indonesia to try and reduce forest fires in view of rising concerns over national costs associated with fires and haze (Herawati and Santoso, 2011). The public health, economic and diplomatic impacts of the haze, as well as problems such as loss of biodiversity, consequences for traditional livelihoods, and the destruction of natural and cultural capital, are increasingly recognised. Initiatives such as REDD+ have also made efforts to stop deforestation more attractive to Indonesia.

These Indonesian actions are essential and can be bolstered, albeit modestly, by regional efforts. To tackle the fires effectively, Indonesia needs to develop realistic and measurable goals while accepting active support from neighbouring ASEAN member states; and such support must be forthcoming. Such a sentiment is not novel and is encoded in the ASEAN Agreement on Transboundary Haze Pollution, which calls for 'concerted national efforts and intensified national, regional and international cooperation' in response to haze challenges (ASEAN, 2002: Article 2). These principles remain as relevant today as they did in the wake of ASEAN's early movements on haze, and member states should continue to explore collaborative possibilities to mitigate forest clearing in Indonesia. They should do so, however, with sober assessments of their own limitations, all while diligently monitoring, predicting and preparing for the fog.

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