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## Transboundary Haze: How Might The Singapore Government Minimise Its Occurrence?

### The Haze Returns, Again

At noon on 21 June 2013, the three-hour Pollutant Standards Index (PSI)<sup>1</sup> reading in Singapore hit an all-time hazardous high of 401.<sup>2</sup> This came after more than a week of steadily worsening haze from forest fires in Indonesia's Riau Province, which had shrouded Singapore with a thick, acrid layer of pollutants.

Singapore is no stranger to the haze. Transboundary haze, caused by the burning of forests and peat lands in Kalimantan and Sumatra, has been a sporadic problem in Southeast Asia since 1985. It was labelled "the most serious problem in the region" by the Association of Southeast Asian Nations (ASEAN) following the long and severe 1997-98 haze episode.<sup>3</sup>

The 1997-98 haze episode was a turning point for at least two reasons. First, then-President Suharto accepted responsibility for the haze by apologising for the damage done. The Asian Development Bank (ADB) estimated that the 1997-8 haze had cost Indonesia between USD8.5 and 9.4 billion (see **Exhibit 1**).<sup>4</sup> The estimated damages to Singapore were between USD163.5 and 286.2 million, with the greatest impact on tourism (about USD136.6 to 210.5 million) (see **Exhibit 2**).<sup>5</sup>

Suharto's apology was the first in a series of apologies made by Indonesia's presidents for the haze. In 2006, President Susilo Bambang Yudhoyono apologised to neighbouring countries for the haze and declared "a war against the haze". He apologised again in 2013, adding, "To

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<sup>1</sup> PSI is an index developed by the United States Environmental Protection Agency (USEPA). During haze episodes, when PM10 is the main pollutant, the USEPA guideline is to compute PSI based on the 24-hour concentration level of PM10.

<sup>2</sup> "Hazewatch: PSI readings today", *Today*, August 20 2013, <http://www.todayonline.com/singapore/hazewatch-psi-readings-today> (cited on 27 September 2013).

<sup>3</sup> ASEAN, "ASEAN Report to the World Summit on Sustainable Development," updated n.d., [www.rrcap.ait.asia/about/4can/Southeast%20Asia%20Presentation.pdf](http://www.rrcap.ait.asia/about/4can/Southeast%20Asia%20Presentation.pdf) (cited on 11 October 2013)

<sup>4</sup> BAPPENAS-ADB, "Causes, Extent, Impact and Costs of 1997/98 Fires and Drought" (1999)

<sup>5</sup> Euston Quah, "Transboundary Pollution in Southeast Asia: The Indonesia Fires," *World Development* 30 (2002):430.

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be honest, I think Riau was quite slow in anticipating this from the beginning. But there's no need to play the blame game. Let's just [work] to overcome the haze and fires immediately".<sup>6</sup>

**Exhibit 1: The Economic Cost of the 1997-98 Fires and Haze to Indonesia (US\$ million)**

Sector	Estimated Economic Losses		
	Minimum	Maximum	Mean
Agriculture	2,750	2,750	2,750
Forestry	5,833	6,658	6,245
Health	145	145	145
Transmigration and Buildings and Property	1	1	1
Transportation	18	49	33
Tourism	111	111	111
Firefighting	12	11	12
Total	8,870	9,726	9,298

Source: BAPPENAS-ADB, 1999.

**Exhibit 2: Total damage costs to Singapore due to the 1997 haze (US\$ million)**

Impact	Estimated Economic Losses	
	Minimum	Maximum
Health	4	5
Tourism	137	210
Indirect damages	23	71
Total	164	286

Source: Cited in Quah, 2002.

Second, 1997-8 haze was a turning point for it galvanised ASEAN into developing a more decisive regional response to the haze. In the immediate aftermath of Suharto's apology, the Regional Haze Action Plan (RHAP) – intended to monitor, mitigate, and prevent land and forest fires – was launched and endorsed by all ASEAN members.<sup>7</sup> In 2003, the ASEAN Agreement on Transboundary Haze (Haze Agreement) came into effect. While most ASEAN members have ratified the Haze Agreement, Indonesia, the most critical actor in the haze problem, has yet to do so.

In spite of these efforts, the Southeast Asian skies have not remained clear. Instead, the PSI levels recorded in Singapore during the 2013 haze incident far exceeded the maximum 226 recorded during the 1997-98 episode.

<sup>6</sup> "SBY Apologizes to Singapore and Malaysia for Haze," *Jakarta Globe*, June 24, 2013, <http://www.thejakartaglobe.com/news/sby-apologizes-to-singapore-and-malaysia-for-haze/> (cited ( October 2013).

<sup>7</sup> ASEAN Haze Action Online, "Regional Haze Action Plan," updated n.d., [http://haze.asean.org/?page\\_id=213](http://haze.asean.org/?page_id=213) (cited on 6 January 2014).

The perennial haze raises several questions. First, given the large economic loss caused by the fires and haze, why is there a lack of robust responses to the problem? Despite expert claims that the haze is a complex but manageable problem, it has proven to be remarkably intractable for several decades. In contrast, the United Nations Economic Commission for Europe (UNECE)'s Convention on Long-Range Transboundary Air Pollution has emerged as a successful regional remedy for Europe's transboundary environmental problems.<sup>8</sup> What is it about ASEAN and, in particular, Indonesia that make effective remedies elusive?

Second, given Indonesia and ASEAN's political peculiarities, should Singaporean policymakers muster a more effective unilateral response to mitigate haze? If so, what form should this response take?

This case will address these questions by first considering the causes of the haze, the measures that have been taken to mitigate haze, and the reasons they have fallen short. It concludes by considering if the Singapore government should act unilaterally to mitigate the fires and haze problem and, if so, how it should go about doing it.

## **Causes of the Haze**

Burning is quick, cost-effective, and enriches the soil. It is therefore the preferred land-clearing method for both small-scale farmers (henceforth, smallholders) and large companies. It is difficult to apportion the responsibility for the fires between these two groups. Satellite data from June 2013 showed that 52 percent of the fire hotspots were in pulpwood and oil palm concession areas, but, by itself, satellite data does not indicate who started the fire or how it was spread.<sup>9</sup>

The fire and haze problem has persisted due to the confluence of factors such as the Indonesian's government development policies that encourage resource exploitation, the increase in global demand for pulp and palm oil, and weak forestry governance. Exacerbating the problem are the fire risks caused by poor logging practices, Indonesia's peatlands, and droughts especially those arising from the *El Nino*.<sup>10</sup>

### ***1. Development policies encouraging resource exploitation***

Over the years, the Indonesian government have supported the clearance of tremendous amounts of forest lands by granting concessions to pulpwood, logging and oil palm companies. Based on the United Nations Food and Agriculture Organisation's estimates,

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<sup>8</sup> Asit Biswas, Cecilia Tortajada, "Tackling haze: Learn from the Swedes," *Straits Times*, August 23, 2013.

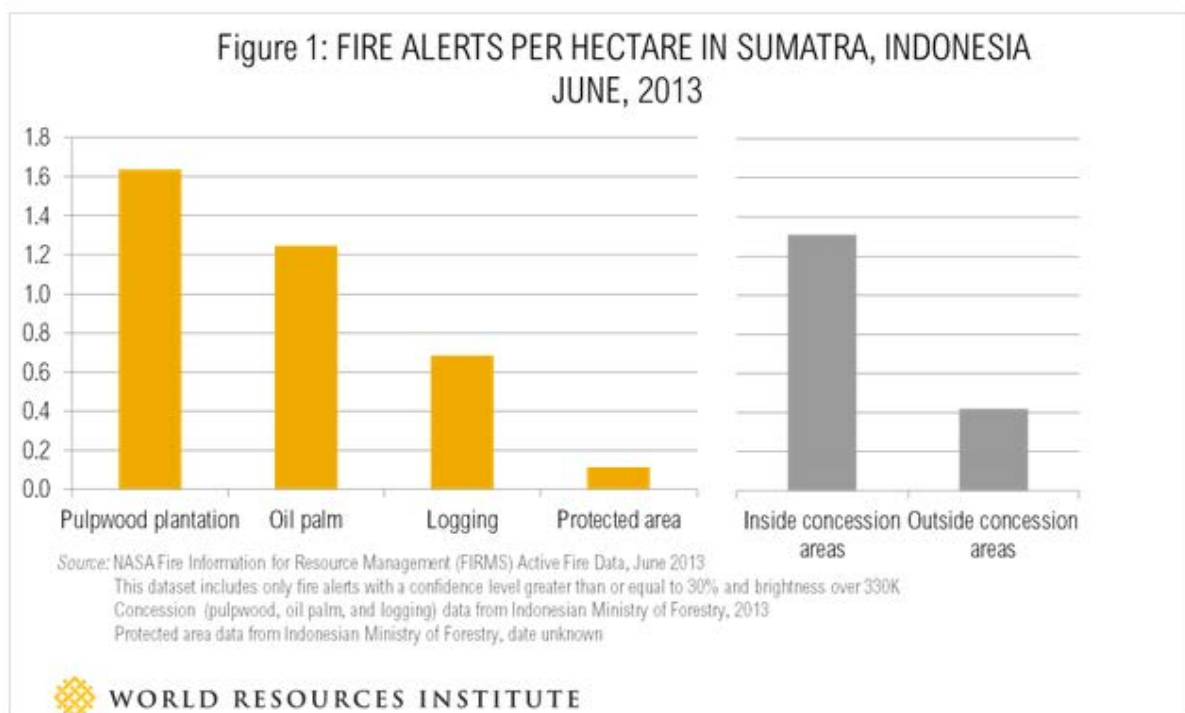
<sup>9</sup> Nigel Sizer et. al., "Peering Through the Haze: What Data Can Tell Us About the Fires in Indonesia," updated 21 June 2013, <http://insights.wri.org/news/2013/06/peering-through-haze-what-data-can-tell-us-about-fires-indonesia> (cited on 3 October 2013).

<sup>10</sup> The *El Nino* Southern Oscillation (ENSO) refers to the oscillation of ocean atmosphere system in the tropical Pacific, which occurs every two to seven years in Indonesia with varying intensity. The 1997/98 *El Nino* reduced annual rainfall to approximately 10 percent of its normal volume in parts of Kalimantan. The combination of extreme dryness, coupled with the heavy fuel loads in logged forests, and the widespread use of burning for land clearance resulted in the protracted and severe 1997/98 haze episode.

between 1990 and 2010 alone, Indonesia lost 24 million hectares of forests mainly to plantations and illegal logging.<sup>11</sup>

There has been growing evidence linking forest fires to concession areas. By superimposing hotspot maps on concession maps, the World Resource Institute found that more than three times as many fire hotspots were observed within logging, pulpwood and oil palm concession areas as compared to outside these concession areas during the June 2013 haze (see **Exhibit 3**).<sup>12</sup> In addition, the density of hotspots was greatest within pulpwood and oil palm plantations.

**Exhibit 3: Density of fire hotspots by location**



Source: World Resource Institute

During the Suharto New Order period, natural resource exploitation was dominated by a clique of businessmen with political connections to his family. These businessmen were able to exert inordinate influence over, and even override, governmental agencies and policies, and remained largely free from regulatory supervision and control.<sup>13</sup> Government officials and their allies in the forestry and agribusiness industries blamed smallholders, periodic droughts and other vagaries of nature for forest fires. For instance, during the 1982-83 fires in East Kalimantan, despite ample evidence of poor logging practices, the Forestry Minister

<sup>11</sup> Food and Agriculture Organization of the United Nations, “Global Forest Assessment, 2010,” updated 17 December 2012, <http://www.fao.org/forestry/fra/fra2010/en/> (cited on 3 October 2013).

<sup>12</sup> Nigel Sizer, “Haze risk will remain high,” updated 17 July 2013, <http://www.thejakartapost.com/news/2013/07/17/haze-risk-will-remain-high.html> (cited on 6 January 2014).

<sup>13</sup> Alan Khee-Jin Tan, “The ASEAN Agreement on Transboundary Haze Pollution: Prospects for Compliance and Effectiveness in Post-Suharto Indonesia,” in *N.Y.U. Envtl. L.J.* 647 (2005):671-672.

Sudjarwo told the press that “nomadic cultivators who use the outdated techniques” were the primary cause of the fire and the logging companies were “not responsible”.<sup>14</sup>

With the fall of Suharto’s regime and the introduction of regional autonomy, provincial and local governments became entitled to the revenues from resource exploitation and were empowered to grant small-scale timber harvesting and forest conversion permits (known as Timber Extraction and Utilisation Permits or IPPK). To raise revenue, many regency (*kabupaten*) governments have awarded numerous short-term permits, usually to companies that are joint ventures between Indonesian regional entrepreneurs and Indonesian or Malaysian timber buyers. In practice, many IPPKs have been granted within the boundaries of existing timber concessions awarded during the New Order era, and in customary (*adat*) forests, resulting in multiple claims over the same land and greater uncertainty about the identity of those who engage in illegal burning.<sup>15</sup>

## **2. *Rising global demand***

The growth in domestic and global demand for pulp, and palm oil for food production and biofuel have also fuelled the growth of these industries in Indonesia, often with the aid of foreign capital and technical expertise.<sup>16</sup> Malaysian and Singaporean companies purportedly hold concessions to more than two-thirds<sup>17</sup> of Indonesia’s total plantation area, which spanned 7.8 million hectares in 2011.<sup>18</sup>

Since the 2006 haze episode, the Indonesian government has alleged that both Malaysia- and Singapore-owned oil palm companies are behind the fires leading to the haze. During the 2013 haze episode, for instance, the Indonesian Environment Minister identified eight Malaysian companies with fire hotspots on their concessions.<sup>19</sup> These companies denied any wrong-doing.

## **3. *Weak forestry governance***

Indonesia’s resource exploitation policies and the stronger demand for pulp and palm oil by themselves would not result in a persistent haze problem if not for weak forestry governance. Most of the problems – weak governance, poor enforcement and ambiguous property rights –

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<sup>14</sup> James Schweithelm, *Trial by Fire* (Washington DC: World Resources Institute, Forest Frontiers Initiative, 2000).

<sup>15</sup> Christopher Barr. et. al., “The Impacts of Decentralisation on Forests and Forest-Dependent Communities in Malinau District, East Kalimantan,” updated 2001, [http://www.cifor.org/publications/pdf\\_files/Books/Decentralisation-Case3.pdf](http://www.cifor.org/publications/pdf_files/Books/Decentralisation-Case3.pdf) (cited 11 October 2013).

<sup>16</sup> James Schweithelm, and David Glover., “Causes and Impacts of the Fires,” in *Indonesia’s fires and haze: The cost of catastrophe*, eds. David Glover, Timothy Jessup (Singapore: Institute of Southeast Asian Studies, 1999), 25.

<sup>17</sup> WALHI, Sawit Watch, Celcor reports, quoted in Helena Muhamad Varkkey, “The ASEAN Way and Haze Mitigation Efforts,” *Journal of International Studies* 8 (2012): 78.

<sup>18</sup> Krystof Obidzinski, “FACT FILE – Indonesia world leader in palm oil production”, updated 8 July 2013, <http://blog.cifor.org/17798/fact-file-indonesia-world-leader-in-palm-oil-production/#.UkKQIJyBGQd> (cited on 3 October 2013).

<sup>19</sup> Zakir Hussain, “Haze Update: Indonesia names eight companies investigated for burning,” *Straits Times*, June 22, 2013.

were already endemic during the Suharto New Order Regime and have persisted, arguably to an even larger extent, after his ouster and the introduction of regional autonomy in 2001.

*(1) Weak governance, poor enforcement*

Academic Eduardo Araral has argued that Indonesia's Forestry Ministry, which is engaged in both the development and regulation of the forestry sector, lies at the heart of the fires and haze problem. It has little incentive to penalise recalcitrant pulp, palm oil and logging companies. Rather, it has vested interests to promote and protect these companies in the interest of revenue.<sup>20</sup>

But the problem goes beyond the conflicts of interest; concession allocation decisions are opaque and possibly corrupt. Indeed, Indonesia's forestry ministry has been singled out by the Indonesia Corruption Eradication Commission (KPK) as being one of the most corrupt.<sup>21</sup> This further reduces the incentive for close scrutiny and enforcement against errant companies because doing so could implicate senior officers within the Forestry Ministry of corruption.

Decentralisation or regional autonomy in Indonesia might have exacerbated the problem. First, decentralisation has proceeded well before the regencies (*kabupatens*) have had the time to develop strong institutions necessary for good governance.<sup>22</sup> When fires break out, the regional governments face basic capacity problems, such as the lack of personnel and budget as well as inadequate training for fire suppression. There has also been inadequate forest and fire management plans, and facilities to prevent and suppress accidental or escaped fires in plantations and natural forests.

Second, decentralisation has increased the local elites' access to the profits from natural resource exploitation, and arguable worsened the opacity and corruption that is associated with the allocation of concessions. In a 2001 study on the impact of decentralisation on the forestry industry in the Malinau regency in East Kalimantan, the Centre for International Forestry Research (CIFOR) found that the allocation of logging permits by the Malinau regency government "has created profit-making opportunities for a range of actors who had theretofore been largely excluded from Indonesia's timber sector".<sup>23</sup> These have further weakened the incentives for strict enforcement, thereby giving greater play to commercial interests, often at the expense of smallholders.

The justice system has not performed any better. Though the necessary laws to tackle illegal burning exist, prosecution and conviction rates are low due to the evidentiary burdens facing the prosecution/plaintiff, and corrupt law enforcement officials.<sup>24</sup>

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<sup>20</sup> Eduardo Araral, "The Fire and Haze Problem: Causes, Consequences and Long Term Solutions," *Unpublished*, 2006.

<sup>21</sup> Ben Bland, "Indonesia extends logging moratorium to protect rainforests," *The Financial Times*, May 15, 2013.

<sup>22</sup> Alan Khee-Jin Tan, 700.

<sup>23</sup> Christopher Barr. et. al.

<sup>24</sup> Alan Khee-Jun Tan (2005), 678.

## *(2) Ambiguous property rights*

Smallholders are vulnerable to the loss of property right over their land. This stems from the contradiction between traditional agrarian laws, which go some way in recognising community land claims and the Indonesian civil laws, first introduced during the Suharto regime, which asserts that the state owns all forests. In practice, this contradiction has resulted in government-issued concessions to large companies that overlap with smallholders' land claims. When disputes boil over, local communities may use arson as a weapon. Fires are also started by commercial interests to intimidate local communities into submission or to decrease their land value. When this happens, smallholders may use fire as a defensive weapon against a hostile takeover of their land.<sup>25</sup>

The overlapping land claims also makes it difficult to pinpoint culprits when fires lead to haze. This thereby makes the enforcement of anti-burning laws challenging.

## **4. *Fire hazard posed by illegal logging practices and peat lands***

The impact of open burning is compounded by fire hazards, which originate from two sources – logging and peat lands. Poor logging practices, even by those with concession permits, result in an accumulation of large amounts of flammable waste wood on logged over areas. Compounding this are illegal loggers who usually remove valuable, more fire-resistant tree species and open up the canopy, and therefore the forest to fresh oxygen. Fire-prone weeds, grass and shrubs tend to grow in logged over areas thereby rendering the forests more susceptible to fire. Once a naturally forested area is burnt, the risk of future fires also increases, due to changes in vegetation cover.<sup>26</sup> Furthermore, when logging companies fail to comply with contractual commitments to protect their concessions from encroachments, these unguarded areas are left open to settler farmers who then use fires to clear the land.<sup>27</sup>

Another fire hazard is peat lands. Indonesia has the largest area of peat land in the tropical zone, estimated to be between 169,000 and 270,000 square kilometres.<sup>28</sup> When these peat land swamps are drained to irrigate plantations in industrial concessions, or for illegal logging activities, they become extremely flammable. Peat swamp forest fires are also more intense because of their propensity to smoulder underground for months, releasing large amounts of smoke, carbon dioxide, and other pollutants which pose a serious threat to both human health and the environment.<sup>29</sup> The threat of peat land fires has been exacerbated by the rapid expansion of plantations into peatlands, which has been enabled by the low valuation of peat swamp forests. Between 2000 and 2012, 70 percent of oil palm plantation area in the Riau

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<sup>25</sup> Alan Khee-Jin Tan (2005), 711. Also see footnote 318.

<sup>26</sup> Grahame Applegate, Unna Chokkalingam and Suyanto “The Underlying Causes and Impacts of Fires in South-East Asia”, March 2001. <http://www.cifor.org/fire/pdf/pdf45.pdf>

<sup>27</sup> Eduardo Araral.

<sup>28</sup> Estimates published in the International Mire Conservation Group's Global Peatland Database, Report on Indonesia (2004). [http://www.imcg.net/media/download\\_gallery/gpd/asia/indonesia.pdf](http://www.imcg.net/media/download_gallery/gpd/asia/indonesia.pdf)

<sup>29</sup> Fatwa Ramdani, and Masateru Hino, “Land Use Changes and GHG Emissions from Tropical Forest Conversions by Oil Palm Plantations in Riau Province, Indonesia”. *PLOS* 7 (2013).



Province was developed on peatlands.<sup>30</sup> It is thus unsurprising that, for the 2013 fires, two thirds of the fire hotspots occurred on peatlands, rather than primary forests.<sup>31</sup>

## **Current Approaches for Combating Haze**

The haze has persisted in spite of some efforts at the state, regional and international levels to combat it.

### ***1. State Level: Regulations, political will and lobbying***

Indonesia has laws against illegal burning, but as noted these laws are a weak deterrent due to poor enforcement and the misalignment of incentives. The self-interests of smallholders, large companies and Indonesian officials looking to increase revenue or kickbacks are inconsistent with the actions that have to be taken to uphold the laws.

Nonetheless, there are indications of growing political will. President Susilo Bambang Yudhoyono declared war against haze in 2006. According to *The Economist*, President Susilo has been “uncommonly courageous” in protecting the environment. In 2009, he pledged to cut carbon emissions by at least 26 per cent by 2020. This is significant because most of Indonesia’s carbon dioxide emissions are a consequence of the destruction of forest and peatlands by logging and burning. In 2011, the President imposed a two-year moratorium on granting forest clearing concessions under Norway’s \$1 billion Reducing Emissions from Deforestation and forest Degradation-Plus (REDD+) programme. He extended this moratorium by another two years, in 2013, in spite intense pressure from commercial interests.<sup>32</sup>

Another source of good news is that both non-governmental organisations and the Indonesian media have demonstrated that they share Indonesia’s neighbours’ concerns about the fires and haze problem. Media scrutiny and intense lobbying could increase the electorate’s demand for better environmental and forestry governance as well as better management of the fires and haze problem within Indonesia.

In spite of these hopeful signs, recalcitrance persists in some segments of the Indonesian government. In May 2013, *The Financial Times* reported that the forestry ministry had been resisting President Susilo Bambang Yudhoyono’s attempts to set up a REDD taskforce.<sup>33</sup> International and local green groups have also criticised the 2011 moratorium for its loopholes. These include, amongst others, the fact that it only suspends the issuance of new permits but does not review the permits already granted, that it only applies to primary

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<sup>30</sup> Ibid.

<sup>31</sup> See Nigel Sizer et. al., and Nigel Sizer, “Indonesia Haze Risk will Remain High Unless Ministers Keep Promises,” updated 12 July 2013, <http://insights.wri.org/news/2013/07/indonesian-forest-fire-and-haze-risk-remains-high> (cited on 3 October 2013).

<sup>32</sup> The Economist, “Logging the good news,” *The Economist*, May 25, 2013, <http://www.economist.com/news/asia/21578441-president-has-helped-transform-debate-about-forest-conservation-logging-good-news> (cited on 27 November 2013).

<sup>33</sup> Ben Bland.

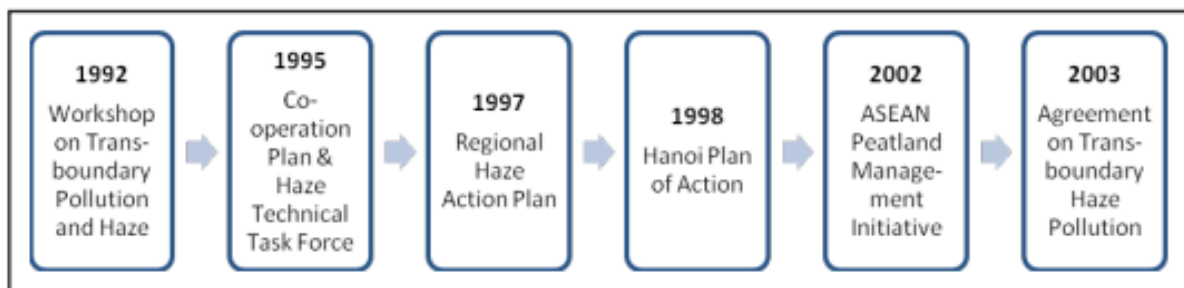


forests, and that it is not legally-binding.<sup>34</sup> Some were chagrined when the moratorium was extended for two more years in 2013 without first addressing these loopholes. Many have also argued that the success of the moratorium turns on better forestry governance at the local level.<sup>35</sup>

## 2. *Regional Level: ASEAN Haze Agreement*

ASEAN's effort to mitigate haze has culminated in the legally binding Haze Agreement, which came into effect in 2003. Since 1985, ASEAN has identified haze as a regional problem, and held several rounds of workshops and meetings. It had also convened a taskforce to address the issue. But it was the severe 1997 haze that provided a fillip to the regional body to devise a regional solution. The RHAP was formulated, which was a non-binding agreement for members to develop national plans, guidelines and other measures to prevent and mitigate fires that could create haze. Indonesia, the main cause of haze, has yet to ratify the Haze Agreement, though its government claims to have begun the process of submitting the request for ratification to its parliament for approval.<sup>36</sup>

**Exhibit 4: Actions that ASEAN has taken to manage the regional haze**



In response to the June 2013 haze, ASEAN leaders agreed on 2 October 2013 to adopt a joint monitoring system and to share satellite data to help better locate fire hotspots, as well as to ascertain if these hotspots are on land owned by plantation companies. While this non-legalistic and co-operative strategy can be seen as a positive step, some have argued that without proper enforcement mechanisms in place, the net impact on haze reduction would still be limited.<sup>37</sup>

Indeed, some critics have argued that the ASEAN Way, which refers to a set of behavioural and procedural norms – the search for consensus; the sanctity of sovereign rights and non-interference; an emphasis on informal and non-legalistic procedures, and flexibility<sup>38</sup> – limits

<sup>34</sup> Alexandra Di Stefano Pironti, "Indonesia Wilts as Deforestation Moratorium Loopholes Go Unaddressed," updated 23 May 2012, <http://www.thejakartaglobe.com/archive/indonesia-wilts-as-deforestation-moratorium-loopholes-go-unaddressed/> (cited on 28 November 2013).

<sup>35</sup> Ben Bland.

<sup>36</sup> Zakir Hussain, "Jakarta moves to ratify Asean haze pact" *Straits Times*, July 5, 2013.

<sup>37</sup> Abhrajit Gangopadhyay, "ASEAN Leaders Agree to Haze Monitoring System" *Wall Street Journal*, October 10, 2013, <http://blogs.wsj.com/searealtime/2013/10/10/asean-leaders-agree-to-haze-monitoring-system/>.

<sup>38</sup> Timo Kivimaki, "The Long Peace of ASEAN," *Journal of Peace Studies* 38 (2001):5-25.

ASEAN's ability to develop a regional response to the haze problem.<sup>39</sup> For example, academic Alan Tan argues that the ASEAN Way of conflict resolution have resulted in a Haze Agreement that imposes weak obligations relating to requesting and receiving assistance, monitoring, reporting, exchanging information and conducting research. The Haze Agreement has no enforcement provisions, and avoids any mention of legal consequences for non-compliance.<sup>40</sup> In a similar vein, academic Nguitragool has argued that "important provisions, including those for developing preventive measures and a national emergency response, are left to member parties to interpret and apply".<sup>41</sup> As a result, the ASEAN initiatives to mitigate haze have to date not been effective as members are allowed to cherry-pick the initiatives that they prefer to pursue, based on their national interests. Notwithstanding its limitations, the Haze Agreement may not remain an ineffectual remedy. As academics Simon Tay and Alan Tan have separately argued, a strict and intrusive treaty may well be unrealistic given the diverse and unequal states in Southeast Asia and ASEAN's aversion to binding instrument. Simon Tay said,

An attempt to coerce an "errant" state into changing its behavior simply would not work. The agreement seeks instead to encourage and enable the polluting state to entertain co-ownership of the problem and consider new modes of addressing it. Unless and until Indonesia ratifies the treaty, or (with or without outside help) takes adequate measures to end the haze or at least minimize the harm to neighboring states, the approach advocated [in the Haze Agreement] cannot be called a success. *Yet without such an approach, success would elude the region even more.*<sup>42</sup>

### **3. Country to country level: Singapore's Programme with Jambi**

In 2007, Singapore and Indonesia formalised their collaboration to jointly develop and implement action programmes to prevent and manage the fires in Jambi Province. A total of seven action programmes were developed and implemented under the two-year long \$1 million collaboration. Amongst these, were the installation of air quality and weather monitoring stations in Jambi and Muaro Jambi Regency, training on fire prevention and suppression capabilities, and an "aquaculture" programme.<sup>43</sup>

According to a report by Singapore's *Straits Times* in June 2013, the collaboration appears to have floundered for at least three reasons. First, the officials in Jambi do not appear to have the confidence and resources to keep the weather monitoring stations operating. For instance, the officials in Jambi stopped using the weather monitoring stations in 2012 after the tape used to record data ran out and was not replenished due to its high cost. An official

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<sup>39</sup> See Asit Biswas, Cecilia Tortajada; Alan Khee-Jin Tan; Helena Muhamad Varkkey.

<sup>40</sup> Alan Khee-Jin Tan (2005).

<sup>41</sup> Paruedee Nguitragool, "Negotiating the Haze Treaty", *Asian Survey*, Vol.51, Number 2, pp. 356-378.

<sup>42</sup> Simon Tay, "Blowing smoke: Regional cooperation, Indonesian democracy, and the haze," in *Hard Choices: security, democracy and regionalism in Southeast Asia*, edited by Donald K. Emmerson (Singapore: ISEAS, 2009): 229.

<sup>43</sup> MEWR, Speech by Dr Yaacob Ibrahim, Minister for the Environment and Water Resources, at Handover Ceremony for the Air Quality and Weather Monitoring Stations, 24 July 2009, 9:30 am at Jambi Province, Indonesia, <http://app.mewr.gov.sg/web/contents/Contents.aspx?Yr=2009&ContId=1341>

with Jambi's Environment Ministry was quoted by the *Straits Times* as saying, "Even if we did (have the recording material), we don't want to touch it because we fear we could damage the sensitive equipment."<sup>44</sup> Second, the aquaculture programme aimed at developing fish farming as a substitute to agricultural farming and deforestation failed to take off because the province lacked the infrastructure support for the export of produce. Third, activists argued that a two-year collaboration was too short to be impactful. Though Singapore has extended an open offer to Indonesia to renew this collaboration and to extend it to other provinces, Indonesia has rebuffed the offer.<sup>45</sup>

In spite of the limited success of the collaboration, the number of hotspots in Jambi has fallen by 70 per cent since 2006.<sup>46</sup> Activist and experts attribute this to the greater awareness amongst residents of the harmful effects of slash and burn farming to them and to their environment.<sup>47</sup>

#### **4. International level: Reducing Emissions from Deforestation and forest Degradation (REDD)**

The United Nation's REDD is a Coasian solution that was developed to reduce carbon dioxide emissions from the forestry industry. REDD+ goes beyond just deforestation and forest degradation, and includes the role of conservation, sustainable management of forests and enhancement of forest carbon stocks.<sup>48</sup> In May 2010, Indonesia and Norway entered into a \$1 billion partnership under the REDD+ framework. This resulted in the four-year moratorium on forest conversion discussed earlier. To date, the Indonesia government has yet to receive any payment from Norway's \$1 billion performance-based fund.<sup>49</sup>

The basic idea behind REDD/REDD+ is to give developing countries the financial incentive to keep their forests and other carbon stores, like peat lands, intact. Every tonne of carbon that stays locked in peat lands or forests would earn a steady stream of carbon credits. Rich countries and big companies can then buy the credits to offset their carbon emissions. The proceeds from these sales would go to project investors and partners, local communities and the Indonesian government. For REDD/REDD+ to work, the financial incentive (the willingness to pay) must compensate for the income and government revenue foregone from not conceding the land to logger and oil palm plantation companies (willingness to accept).

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<sup>44</sup> Zubaidah Nazeer, "S'pore-funded efforts to fight haze face challenges on ground", 1 July 2013 <http://www.stasiareport.com/the-big-story/asia-report/indonesia/story/spore-funded-efforts-fight-haze-face-challenges-ground-201>

<sup>45</sup> Zakir Hussan, "Haze update: Malaysia, Singapore should 'know themselves', says Indonesian minister", *Straits Times*, June 24 2013, <http://www.straitstimes.com/breaking-news/se-asia/story/haze-update-malaysia-singapore-should-know-themselves-says-indonesian-mi> (cited on 3 October 2013).

<sup>46</sup> Ibid.

<sup>47</sup> Ibid.

<sup>48</sup> UN-REDD Programme, "About REDD+," updated 2009, <http://www.un-redd.org/AboutREDD/tabid/102614/Default.aspx> (cited on 27 November 2013).

<sup>49</sup> Chris Lang, "Almost half of Norway's climate and forest aid remains unspent," updated 20 September 2013, <http://www.redd-monitor.org/2013/09/20/almost-half-of-norways-climate-and-forest-aid-remains-unspent/> (cited on 28 November 2013).

However, *The Economist* reported that even well-meaning Indonesian officials doubt whether REDD/REDD+ can match the money that timber and oil palm barons offer.<sup>50</sup>

The success of carbon trading would also depend on having a navigable approval framework. The Rimba Raya project, approved in December 2012, demonstrated that the approval process can be both lengthy and uncertain. The project, which sought to preserve 90,000 hectares of forest in Borneo, appeared poised to receive approval from the Indonesian government in 2010. But the approval process stalled and the forestry ministry cut the area by half because an oil-palm company had an overlapping boundary with the Rimba Raya project. In 2012, the project received the go-ahead after the area preserved was reduced from 90,000 hectares to 64,000 hectares.<sup>51</sup>

The timescale of the Rimba Raya project at 30 years also suggests that for REDD/REDD+ programmes to work, there has to be a sustainable source of rich companies and countries willing and able to buy carbon credits for a long period of time. Funds that are pledged for only short time periods may therefore undermine the success of carbon trading programmes.

### **What Should Singapore Do?**

Public anxiety in Singapore skyrocketed when the 2013 haze struck, especially during the days when PSI readings reached “very unhealthy” and “hazardous” levels – worse than the levels recorded during the 1997 haze.<sup>52</sup> Supplies of N95 masks ran low in pharmacies across the island owing to the overwhelming demand for them.<sup>53</sup> Profiteers cashed in on the noxious air quality by inflating the price of not only N95 masks but also surgical masks, which were *ineffective* against the haze. Blogs and online forums perpetuated confusing reports about PSI readings, and about the availability of N95 masks.<sup>54</sup> This confusion was further exacerbated by misinformation spread rapidly through the Internet, which included a doctored screenshot of the National Environment Agency (NEA)’s website accompanied with allegations that NEA was misreporting PSI readings, and unsubstantiated claims of a local hospital

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<sup>50</sup> The Economist, “Saving Indonesia’s Trees – REDDY at last,” updated 8 December 2012, <http://www.economist.com/news/asia/21568002-good-news-forest-and-people-forest-reddy-last> (cited on 28 November 2013).

<sup>51</sup> Ibid.

<sup>52</sup> See, for example, “Haze: API in Muar spikes at 746,” updated July 10, 2013, <http://www.thestar.com.my/News/Nation/2013/06/23/Haze-API-in-Muar-spikes-at-746.aspx> (cited 1 October 2013).

<sup>53</sup> Amelia Teng And Maryam Mokhtar., “Haze Update: N95 masks sell out quickly at pharmacies,” *Straits Times*, June 22, 2013 <http://www.straitstimes.com/breaking-news/singapore/story/haze-update-n95-masks-sell-out-quickly-pharmacies-20130622> (cited on 1 October 2013).

<sup>54</sup> SG Press Centre, “Reply by Minister for Defence Dr Ng Eng Hen to Parliamentary Questions related to the Haze, 8 July 2013,” updated 8 July 2013 [http://www.news.gov.sg/public/sgpc/en/media\\_releases/agencies/mindef/press\\_release/P-20130708-1.html?AuthKey=c10ab327-c821-544d-8dde-5e5d54f73592](http://www.news.gov.sg/public/sgpc/en/media_releases/agencies/mindef/press_release/P-20130708-1.html?AuthKey=c10ab327-c821-544d-8dde-5e5d54f73592) (cited 3 October 2013).

overcharging buyers of N95 masks.<sup>55</sup> Netizens criticised the government for its perceived slow response and lack of prior planning.<sup>56</sup>

While the public reaction may have been a signal of demand for a clearer national response to the haze, it is debatable whether Singaporeans agree that their government should also play a more proactive role in combatting the haze *at its source*. Besides, apart from transboundary haze, Singapore has other, perhaps more important, issues on its agenda with Indonesia, such as border issues, and extradition agreements. It may well be wise for Singapore to preserve its political capital with Indonesia to address those other issues.

During the June 2013 haze episode, most commentators acknowledged that the Singapore government could not do much about cross-border pollution due to the fundamental principle of sovereignty in international law. They nevertheless argued that Singapore was not without recourse.

### **1. Coasian Solutions**

Apart from the REDD+ programmes, there are other Coasian solutions that Singapore can explore. Singaporean academic Euston Quah proposed that Singapore add up the cost of the haze in terms of the medical bills, tourism losses, businesses hit and face masks bought. Armed with this bill, Singapore could then go to a third-party country which has leverage over Indonesia to exert pressure on Indonesia to reduce the fires and haze problem. Alternatively, the bill could be used to size Singapore's assistance to Indonesia, or its assistance to domestic sectors affected by the haze.<sup>57</sup>

As with REDD/REDD+, if Singapore decides to pay Indonesian communities and businesses to stop polluting, the financial incentive must be large enough to compensate the farmers and businesses for the costs that they would incur in either conserving forests and peatlands or in using more environmentally friendly methods to clear them. The financial incentives could be financed from government revenues, but Quah suggested that the community too could pay. He said, "The logical choice is that the Environment Ministry sets up an agency or unit to solicit values of people and firms' willingness to pay. I don't see why we can't do it here [in Singapore], since we have an affluent, educated society".<sup>58</sup>

### **2. Pressure Indonesia to ratify the Haze Agreement**

As noted, Indonesia remains the only ASEAN country that has yet to ratify the Haze Agreement. Academics Simon Tay and Chua Chin Wei urged ASEAN's Environment

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<sup>55</sup> MCI Press Room, "MCI's response to PQs on misinformation during the haze episode and role of Media Literacy Council", [http://www.mci.gov.sg/content/mci\\_corp/web/mci/pressroom/categories/parliament\\_qanda/mci\\_s\\_response\\_top\\_qsonmisinfomationduringthehazeepisodeandthero.html](http://www.mci.gov.sg/content/mci_corp/web/mci/pressroom/categories/parliament_qanda/mci_s_response_top_qsonmisinfomationduringthehazeepisodeandthero.html) (cited 3 October 2013).

<sup>56</sup> An example of criticisms: "Why is there no existing crisis plan to manage haze crisis", <http://jentrifiedcitizen.wordpress.com/2013/06/21/why-is-there-no-existing-crisis-plan-to-manage-haze-crisis/> (cited 3 October 2013).

<sup>57</sup> Feng Zengkun, "'Putting a dollar value on haze' can help Singapore," *Straits Times*, June 24, 2013.

<sup>58</sup> *Ibid.*

Ministers to convince Indonesia to ratify the Haze Agreement.<sup>59</sup> Under international law, a state would be obliged to refrain from acts that would defeat the purpose of the treaty that it signs. In the case of the Haze Agreement, the purpose is “to prevent and monitor transboundary haze pollution [...] through concerted national efforts and intensified regional and international cooperation.”<sup>60</sup>

### **3. Legal action against the culprits<sup>61</sup>**

If the culprits can be identified, there are international laws under which they can be prosecuted. Academics Tommy Koh and Michael Ewing-Chow argued that the fundamental principle of international environmental law – that activities in one state’s territory should not cause transboundary harm – gives Singapore and other ASEAN countries legal basis for taking the culprits to task. The chief challenge with implementing this strategy is evidentiary – satellite data alone is insufficient for establishing who the culprits are. Compounding this are Indonesia’s and Malaysia’s reluctance to share their concession maps, which are required to establish which landholdings the hotspots are located at. To effectively pursue this strategy, Singapore would also need to have eyes and ears on the ground to verify that the fires were indeed started by the party that holds the land concession.

The two academics suggested that another way governments can take action against the illegal burning by palm oil plantation owners is by banning the import of their products. To do this, governments can rely on the “necessary to protect [...] health” exception found in trade agreements. But once again, this legal remedy may pose significant evidentiary burdens. Singapore would have to prove that the products were indeed linked to the fires that caused the haze and that invoking this clause was the least restrictive solution.

### **4. Working with social and environmental NGOs and researchers**

As noted earlier, one of the positive developments has been the sustained attention that media-savvy international and Indonesian social and environmental NGOs have been paying to the fires and haze problem. Academics Asit Biswas and Cecilia Tortajada encouraged governments to enlist the help of NGOs in tackling the haze problem. They argued that rather than resort to legal action, boycotts of the products of errant companies may be more effective.<sup>62</sup> The problem with this solution, however, is that a government-instigated boycott could run counter to Singapore’s trade obligations with Indonesia. The government may still have to rely on trade or international laws to justify its stance.

Another alternative raised by the duo was for governments to invite academic and research institutions to conduct definitive studies on the economic, social, environmental and health

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<sup>59</sup> Simon Tay and Chua Chin Wei, “The haze: What governments must do, and what they can’t,” *The Malaysian Insider*, September 23, 2013.

<sup>60</sup> Tommy Koh, Michael Ewing-Chow, “Insight: The transboundary haze and the international law,” *The Jakarta Post*, June 27, 2013.

<sup>61</sup> *Ibid.*

<sup>62</sup> Asit Biswas and Cecilia Tortajada, “Tackling haze: Learn from the Swedes,” *Straits Times*, August 23, 2013.

costs of the haze so that there are reliable estimates of the full impact of the haze on the region.

### ***Beyond a Governmental Solution?***

As the solutions above illustrate, a governmental solution is likely to be highly imperfect. Commentators have therefore suggested that non-governmental actors may also have a role to play. For instance, NGOs could put pressure on big buyers to only purchase products from palm oil companies that engage in sustainable practices. This has worked in some instances, as companies like Unilever have taken steps to buy only certified palm oil, despite higher costs. Standard Chartered Bank now screens its corporate borrowers on environmental parameters, such as credit and reputational risks.<sup>63</sup>

The chief benefit of a citizen-led boycott is that it does not run afoul of international laws and trade obligations. An effective boycott would, however, turn on good quality information about the location of the hotspots and the identity of the land concession holders. In the absence of accurate and detailed maps, this task is difficult. But it may not be insurmountable; NGOs can develop their own detailed concession maps through investigative work.

### **Discussion Questions**

1. What larger problems does the Southeast Asian transboundary haze shed light upon? How do these problems hinder the development of a decisive solution to the problem?
2. Would the skies clear up if Indonesia ratifies the Haze Agreement? Why or why not?
3. Should the Singapore government consider measures to mitigate haze at its source? If you think it should, what strategies would you recommend and why? If you think it should not, what are your reasons?

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<sup>63</sup> Simon Tay and Chua Chin Wei.