

The Political Economy of Transboundary Pollution: Mitigation Forest Fires and Haze in Southeast Asia

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Introduction

The term ‘haze’ has been used in the Southeast Asian region to refer to ‘sufficient smoke, dust, moisture, and vapour suspended in air to impair visibility’. Haze pollution is transboundary when ‘its density and extent is so great at the source that it remains at measureable levels after crossing into another country’s airspace’ (ASEAN Secretariat, 2008). Since 1982, this transboundary ‘haze’ pollution developed into an almost annual occurrence in the region, with the worst episodes being in the period of 1997 to 1998 and in 2006 to 2007 (ASEAN Secretariat, 2008, Suwarsono et al., 2007). The haze affects the health of some 75 million people and the economies of six Southeast Asian nations; Indonesia, Malaysia, Singapore, Thailand, Brunei, and the Philippines (Mayer, 2006). Despite these extreme and far-reaching impacts, haze mitigation efforts thus far have not been able to effectively curb haze occurrences in the region.

Many scholars have proposed frameworks for effective haze mitigation (see Florano, 2003, Brachtel, 2004, Syarif, 2007). One framework, strongly rooted in the political economy, is Quah’s (2002) stakeholders’ approach to cost-sharing, discussed in his 2002 article in *World Development*. Responsibility for the mitigation of a certain problem can be conceptualized around particular groups in society that might seem to have a ‘stake’ of magnitude in the

problem, much like those with a 'share' in a corporate enterprise (Leiss, 1995). Hence these particular groups of stakeholders identified can be from a fairly wide diversity of groups and be regarded as having an 'interest' in policy options and outcomes: those engaged in relevant decisional processes; those controlling potentially available public funds; those affected by related outcomes, beneficially or adversely; and 'concerned' institutions and individuals motivated by a sense of public responsibility. This idea of stakeholders' responsibility envisages a sharing of costs among government-controlled state and interstate systems, corporate enterprises, and non-corporate institutions associated with the 'civil society' sector. With regards to the problems of transboundary impacts, the stakeholders' responsibility approach should thus not be restricted to domestic concerns but extended to international concerns as well (Quah, 2002).

In the 2002 article, Quah proposed a categorization of stakeholders with an 'interest' in transboundary haze in Southeast Asia. He argued that the cost of an effective fire prevention and control program in Indonesia should be shared among the various 'stakeholders' and other interested and concerned institutions both inside and outside the region. He proposed a scheme whereby there is an equitable distribution of responsibility for mitigation of the haze according to these categorization. Ten years on, this report aims to explain the progress (and non-progress) on transboundary haze mitigation based on this stakeholder approach to cost-sharing. The following two sections of this report identify the culprits and victims of transboundary haze, whom are the major stakeholders in the wake of the Indonesia forest fire. The next section then analyses major haze mitigation efforts since 2002, and compares them with the proposed equitable distribution categorizations with case studies of Malaysian and Singapore government efforts. The report will

then be concluded with a general discussion on the roles expected from stakeholders in the future.

Background: Forest Fires and Transboundary Haze

Forest fires in Indonesia have been extensively recorded since the 19th century (Eaton and Radojevic, 2001). The cyclical El Niño phenomenon, which cause prolonged drought across the country every three to seven years creates conditions favourable for these fires. As a result, Indonesia often experienced severe conflagrations during the El Niño years, especially in the provinces of Kalimantan and Sumatra. However, in the recent years, there were signs of evidence that the incidence of fire in Indonesian forests is being decoupled from El Niño-driven draughts’ (Page et al., 2009) and can be traced mainly to manmade sources.

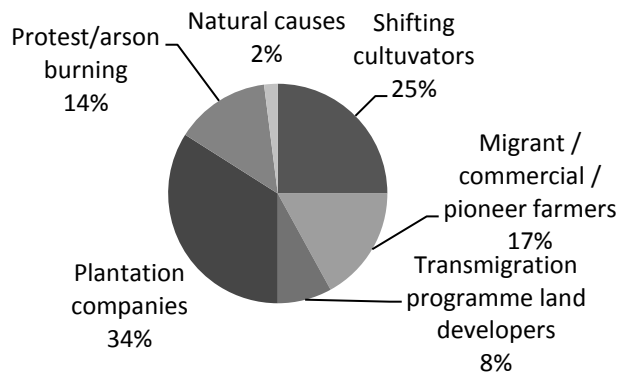


Figure 1: Parties responsible for fire, 1997 World Bank estimates (Jones, 2006)

For the past 50 years, the worst forest fires in Indonesia were the forest fires of 1997-1998 (*Jakarta Post*, 1998). These fires resulted in an estimated 10 million hectares of land being burned around Indonesia (Applegate et al., 2002, Mayer, 2006, Othman, 2003, *Jakarta Post*, 2009), destroying forests and bushland, including conservation areas and national parks

(Dauvergne, 1998). In 2004, satellite images from the Centre for Remote Imaging, Sensing and Processing in Singapore have provided strong evidence linking the fires to the deliberate actions of oil palm plantation companies (Tan et al., 2009, Applegate, 2002, Colfer, 2002, Othman, 2003), estimating that 80% of these forest fires were set by plantation companies or their sub-contractors, while the remaining 20% of these forest fires were set by slash-and-burn farmers (Dauvergne, 1998, Casson, 2002). On the other hand, the World Bank estimated that 35% of these forest fires were plantation fire and that it accounts for the highest single source of fires that year (see Figure 1) (Jones, 2006). It has thus become apparent that these recent forest fires are not merely the result of bad weather or poor methods of shifting cultivation. Instead, oil palm plantation companies are the major ‘culprit’ in the occurrence of forest fires in recent years (Parliament of Singapore, 1998b).

Indonesia is currently the world’s biggest producer of palm oil (McCarthy, 2010, Jarvis et al., 2010, *Reuters*, 2011, World Growth, 2011, *Bernama*, 2010). Indonesia began to focus on oil palm cultivation in the 1980s due to several reasons. Dwindling primary forests meant that Indonesia’s earlier reliance on logging as a driver of its economy was unsustainable. Oil palm prices surpassed rubber during this time, and with land and climate conditions in Indonesia being ideal for oil palm (McCarthy and Zen, 2010), this crop was deemed the most favourable plantation crop to replace logging (Sawit Watch, 2007, WALHI et al., 2009). After local Indonesian investors had established themselves in the palm oil sector, the government of Indonesia had then opened up the oil palm sector to foreign investors (McCarthy and Cramb, 2009), executing bilateral investment treaties with Malaysia and Singapore for the entry of their firms (most of which were government-linked or politically important) (Rajenthiran, 2002). As a

result, Malaysian and Singaporean investments hold more than two-thirds of Indonesia's total plantation area, alongside the large local conglomerates (WALHI et al., 2009).

Rapid opening of oil palm plantations during this time was further fuelled by a specific policy goal that was formulated by the Indonesian government to replace Malaysia as the world's largest palm oil producer (Van Gelder, 2004). Indeed, this was achieved in 2008 when Indonesia overtook Malaysia to become the world's biggest producer of palm oil (McCarthy, 2010, Jarvis et al., 2010, *Reuters*, 2011, World Growth, 2011, *Bernama*, 2010), producing over 25 million tonnes of palm oil annually and contributing to about 51% of the total world production (see Figure 2) (Di, 2011). In terms of revenue, the flourishing palm oil industry contributes around 5% of Indonesia's GDP annually, as shown in Figure 3 (iStockAnalyst, 2009). Approximately half of the agricultural expansion in Indonesia now is allocated for the production of palm oil (Wicke et al., 2011), with a planting rate of 400,000 hectares of land annually (Sawit Watch, 2007). Consequently the incidence of forest fires in Indonesia are closely associated with land use change for oil palm development (McCarthy and Zen, 2010).

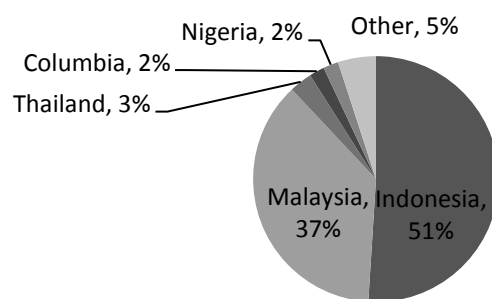


Figure 2: CPO production by country (Trisno, 2001)

Land use change that is often employed in Indonesia for conversion into oil palm plantations include the conversion of pristine peatlands, and of degraded logged-over forests or old cropland. To convert peatlands for planting, the swamp has to be cleared from vegetation, drained, and dried so that the water table drops (Phillips, 1998). While this makes oil palm development on peat soil costly, higher oil palm prices have made it economically viable to do so (Raman et al., 2008). Once any valuable timber on the peatlands are removed and sold, the peat is usually burned to remove any remaining vegetation in preparation for planting (Stone, 2007). Burning is one way to keep costs of removing the peat, as using machinery will be expensive on the soft peatlands (*Jakarta Post*, 1994, Colfer, 2002). Clearing land mechanically can cost up to USD 250 per hectare of land, whereas clearance by fire could cost a mere USD 5 per hectare of land (Salim et. al 2007). Fires set on the peatland often extend beneath the ground and are not visible to the naked eye (Parliament of Singapore, 1998a). These underground fires cover large areas, and would smoulder sometimes for weeks. The smoke that is released by these smouldering fires is usually thick and sooty, because of the organic material contained in the peat. This smoke is then the main cause of the problem of haze in the region (Tan et al., 2009).

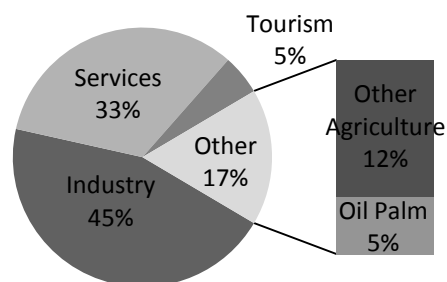


Figure 3: Breakdown of Indonesia's 2010 GDP by sector (iStockAnalyst, 2009)

Similarly with peat, fire is the cheapest and fastest method to clear logged-over forests and croplands. Fire is then used to flatten the stumps left over from logging and old crops, as well as to clear smaller vegetation. In contrast, clearing land with machines and chemicals can cost up to USD 200 per hectare and thus is cheaper to clear the land by fire (Dauvergne, 1998). While the burning of these non-peat lands do not create the smouldering, persistent fires and thick, sooty smoke like those on peatland, the substantial scale of these fires also do contribute to the problem of haze in the region. Combined with the smoke produced from peatfires, the resulting haze then becomes a serious concern.

Magnitude of Damage

Forest fires have severe impact on the surrounding environment, affecting biodiversity, the natural hydrological cycle, microclimate, and of course air quality due to smoke (Purbowaseso, 2004, Sudarmo, 1985). Drastic land conversion like this will then degrade and dry out the natural landscape in such a way that future accidental fires are liable to occur again and are likely to be more severe (Colfer, 2002).

More importantly, the smoke produced from these fires, especially those on the peatland, is high in carbon content. Peatlands are good carbon sinks, thus when the peat burns, carbon that was trapped in these sinks are released into the atmosphere, increasing the level of greenhouse gases, exacerbating climate change (Ministry of Forestry, 2009). It can be seen that 70% of Indonesia's annual carbon emissions comes from the burning of peatlands, and the remaining 30% comes from emissions as a result of peatland drainage (Silvius and Kaat, 2010). It was estimated that during the 1997-1998 fires, 2.5 million tonnes of carbon dioxide was released into the atmosphere (Koh, 2008). As a result of these annual fires, Indonesia is now one of the largest

emitters of greenhouse gases in the world, alongside industrial giants like the United States and China (Hunt, 2010, Greenpeace, 2007).

Indonesia, as the main ‘culprit’ state, is also the major victim of the effects of haze pollution. In 1997, the Indonesian government declared the haze situation a ‘natural calamity’ when air pollution levels reached 1,890 micrograms per cubic meter (Djuweng and Petebang, 1997). The air pollution level is then many times above the tolerable level set by the World Health Organization and the government, which is 130 and 150 micrograms per cubic meter respectively (*Jakarta Post*, 2004). The status of the fires and haze was then elevated to a ‘disaster’ in 1999 (Dennis, 1999), and a state of emergency was declared in the Sumatran province of Riau that year when the Pollutant Standards Index (PSI) there reached 978 (with anything above 400 considered extremely hazardous and life-threatening to the elderly and frail) (*Jakarta Post*, 1999b). In the following years, the annual haze occurrences have then become a routine for Indonesians living in fire-prone areas (*Jakarta Post*, 1999a), especially during the dry months of August to October (Suwarsono et al., 2007).

Impacts	Economic Costs (US\$ million)
<i>1. Haze impacts</i>	
• Medical costs	294.70
• Productivity	167.30
• Indirect impacts	462.00
Sub-total of health impacts	924.00
• Tourism impacts (maximum)	70.35
• Airline impacts	7.54
• Airport closures	10.00
Sub-total of tourism/airline/airport impacts	87.89
Total haze impacts	1,011.89
<i>2. Fire impacts</i>	
• Timber losses	493.67
• Agriculture/plantation losses	470.39
• Direct forest ecosystem production losses	704.97
• Indirect forest ecosystem function losses	1,077.09
• Domestic (capturable) biodiversity losses	30.00
• Fire-fighting costs	11.67
Sub-total of impacts on Indonesia	2,787.79
• Carbon release	272.10
• Global biodiversity losses	not estimated
• Fire-fighting costs	13.46
Sub-total of global impacts	285.56
Total fire impacts	3,073.36
Total overall impacts	4,085.25

Table 1: Summary of total damage costs in Indonesia from the 1997 haze (Ruitenbeek, 1999)

Those closest to the source of the fires, mostly in the large island of Sumatra and the Indonesian side of the Borneo Island, Kalimantan, suffered the worst effects of the haze. At its most severe period, visibility was reduced to a mere 50 metres (Gunawan, 2002b). Schools in affected areas were closed down for extended periods (*Jakarta Post*, 2006), or had their lessons shortened so that the students were not subjected to prolonged exposure to haze (*Jakarta Post*, 2004). Areas close to the source of fires also seen an increase in the temperature level (Hafild, 1997), while locations further away reported that the haze blocked out the warmth of the sun (*Jakarta Post*, 1999b). It was estimated that in 1997, up to 20 million Indonesians sustained health troubles because of the haze (Hafild, 1997), with some hospitals reporting that patient numbers had

exceeded their capacity levels (Djuweng and Petebang, 1997). The severe haze in 2006 also saw 81% of the days between September and November rated as ‘unhealthy/very unhealthy/dangerous’, with 30 days in October being rated as ‘dangerous’ (Harrison et al., 2009). Latest measurements in the major cities of Jakarta, Surabaya, Medan, Bandung, Jambi, and Pekanbaru have also showed that in one year good air quality was only found in 22 to 62 days (Widianarko, 2009).

The fires and haze also took a toll on local infrastructure and economies. Bad visibility because of the smoke hampered land, sea and air transportation (*Jakarta Post*, 1997a), including delaying of the air operations to relieve drought-stricken villages (*Jakarta Post*, 1997b). The 1997 haze was blamed for the fatal crash of a Garuda Indonesia airplane (Djuweng and Petebang, 1997), and the 1999 haze was blamed for a fatal tanker accident in Siak River, Sumatra (Saharjo, 1999). A bus crash in Medan in 2002, killing five passengers, was also blamed on low visibility because of the haze (Gunawan, 2002a). As a result, airlines, travel agencies, and bus companies that are related to the tourism industry saw their business predictably plummet during each haze season (Djuweng and Petebang, 1997). Transportation disruptions also caused price hikes of daily needs and food scarcity in some areas (*Jakarta Post*, 1997a). The 1997 fires and haze cost Indonesia an estimated 4.1 billion that year, equivalent to 4.5% of Indonesia’s gross domestic product (GDP) for the year (see Table 1) (Ruitenbeek, 1999).

Most of this haze has also been spread across national boundaries to Indonesia’s closest neighbours, Malaysia and Singapore. Malaysia suffered the most serious haze occurrence in Malaysian history in September 1997. On 19 September 1997, the Malaysian government declared a state of emergency for Sarawak when the Malaysia Air Quality Index reached 600

(where anything above 300 is considered hazardous to human health and other living things). The emergency lasted for ten days, closing schools and offices. At one point, the index even exceeded 800 in Kuching, the capital of Sarawak (Dauvergne, 1998). The state of Sarawak reported economic losses amounting to RM 1 billion (US\$ 325 million) during the 10-day shutdown (Tawie, 1997). The August 2005 haze episode saw yet another round of state of emergency in several areas in the Peninsula (*Bernama*, 2005), and severe haze conditions continued in 2006 as well. The health of around 18 million Malaysians, or 82% of the general population, were also put at risk by the 1997 haze (see Table 2) (Mohd Shahwahid and Othman, 1999). Damage to local sectors as a result of the 1997 haze cost a total of US\$ 321 million. This amounted to a damage of some US\$ 15 per capita for the country (Othman, 2003).

Type of Damage ¹	RM Million	US\$ Million	Percentage
Adjusted cost of illness	21.02	8.41	2.62
Productivity loss during the state of emergency	393.51	157.40	49.07
Decline in tourist arrivals	318.55	127.42	39.72
Flight cancellations	0.45	0.18	0.06
Decline in fish landings	40.58	16.23	5.00
Cost of fire-fighting	25.00	10.00	3.12
Cloud seeding	2.08	0.83	0.26
Expenditure on masks	0.71	0.28	0.09
Total damage cost	801.90	321.00	100.00

¹ Cost to Malaysian multinational corporations of RM2.5 million (US\$1 million) is not included as this amount might have been used by the government to pay for various avertive expenditures.

Table 2: Summary of total damage costs in Malaysia from the 1997 haze (Mohd Shahwahid and Othman, 1999)

Singapore suffered on equally severe terms. During the worst haze episode in 1997, the PSI hit a record high of 226, which is being rated as “very unhealthy” (*The Straits Times*, 1997). Indeed, as a result of the haze, Singapore suffered a significant negative impact on the economy especially on business, tourism, and citizen health (Fernandez, 1997). Quah had then (1999)

placed a total damage costs in Singapore due to the 1997 haze at a lower-bound estimation of US\$ 163.5 million (see Table 3). This translates to a damage cost of an estimated US\$54.50 per capita. A follow up study during the return of severe haze in 2006 put estimated losses at US\$ 79 million within just the hazy month of the year (*Today*, 2006), largely due to the forced closure of Singapore’s main Changi airport. The haze in 2009 also caused a measurable 20% increase in the number of patients with haze-related problems (*Singapore Government News*, 2010a).

Impacts of haze damages	Upper bound estimation (US\$)	Lower bound estimation (US\$)
<i>Direct damages</i>		
Direct cost of illness	1,535,668	1,186,900
Self-medication expenses	678,943	678,943
Loss in earnings/productivity	2,068,109	1,907,341
Preventive expenditures	234,909	3,524
Total health damage	4,517,629	3,776,708
Loss in Tourism	210,449,067	136,577,290
Loss in local business	N/A	N/A
	214,966,696	140,353,998
<i>Indirect damages</i>		
Loss in visibility and views	71,137,941	23,057,133
Loss in recreation activities	94,170	94,170
Damages to biodiversity	N/A	N/A
	71,232,111	23,151,303
<i>Total damage cost</i>		
	286,198,807	163,505,300
Damage costs per person	95.39	54.50
Damage costs per household	369.90	211.31
% of 1996 GDP	0.32	0.18

Table 3: Summary of total damage costs in Singapore from the 1997 haze (Quah, 1999)

Stakeholders in the Southeast Asian Haze

As seen earlier in Quah’s (2002) work, he had assigned categories to stakeholders that would seem to have sufficient interest or concern to be treated as a potential coalition to share the burden of costs associated with the development and implementation of a truly effective land fire prevention and control program for Indonesia (see Table 4). He proposed that both monetary and nonmonetary contributions from members of the stakeholders' coalition should vary in both the

size and form. The criteria of cost allocation should then be based on how they had caused the haze, the ability to pay, and the revenues of stakeholders. In both monetary and nonmonetary aspects, regional organizations (together with global agencies) should then be assigned the highest burden of the share of cost. This is followed by the culprit state government and industries and victim state governments and industries (see Table 5) (Quah, 2002).

Group	Stakeholders
A	<p><i>"Culprit" state governments</i> (viz. Indonesia and to a much lesser extent, Malaysia)</p> <p>(i) Relevant central government agencies (e.g., Agricultural, Environment)</p> <p>(ii) Regional/provincial agencies</p> <p>(iii) Local authorities (including agencies representing small holder farmers)</p>
B	<p><i>"Victim" state governments</i> (viz. Singapore, Brunei, Malaysia, and Indonesia)</p> <p>(i) Relevant central government agencies (e.g., Health, Environment, Tourism)</p> <p>(ii) Local authorities (including agencies representing small holder farmers)</p>
C	<p><i>"Culprit" industries</i></p> <p>(i) Forestry (pulp and paper)</p> <p>(ii) Palm oil</p> <p>(iii) Ancillary industries (e.g., haulage)</p>
D	<p><i>"Victim" industries</i></p> <p>(i) Tourism and recreation</p> <p>(ii) Airlines</p> <p>(iii) Ancillary industries (e.g., restaurant, entertainment)</p>
E	<p><i>Regional organizations</i></p> <p>(i) ASEAN</p> <p>(ii) APEC</p> <p>(iii) ADB</p>
F	<p><i>Global agencies</i></p> <p>(i) World Bank</p> <p>(ii) IMF</p> <p>(iii) UNDP</p> <p>(iv) UNEP</p> <p>(v) WHO</p> <p>(vi) WMO</p> <p>(vii) UNICEF</p>
G	<p><i>Other "Concerned" institutions in culprit and victim states</i></p> <p>(i) Health care (e.g., hospitals, clinics, medical research)</p> <p>(ii) Environmental protection (e.g., Nature Society)</p> <p>(iii) Schools, colleges, and universities</p> <p>(iv) Religious organizations</p> <p>(v) Charitable institutions</p> <p>(vi) Philanthropic foundations</p>
H	<p><i>"Concerned" nongovernmental institutions</i></p> <p>(i) Emergency associations (e.g., Red Cross, Medics sans Frontieres)</p> <p>(ii) Development NGOs</p> <p>(iii) Environmental NGOs</p>

Table 4: Categories of stakeholders (Quah, 2002)

Quah (2002) had argued that since Indonesia is a member country of the Association of Southeast Asian Nations (ASEAN) and is undergoing a new reformation, a 'Coasian' solution

for transboundary haze would be ideal as it would be a chance for Indonesia to obtain support and recognition from its neighbors and global community (M5, see Table 5). Indeed, a decade later, it can be observed that most of the actions related to haze mitigation have been focused around Coasian solutions under the umbrella of ASEAN (Yahaya, 2000, ASEAN Secretariat, 1995, Severino, 2006), followed by bilateral efforts involving culprit and victim state governments. However, there has been a notable absence of industries involvement in these areas. The following sections will then review these efforts by the government and regional organizations, focusing on the period 2002 to present, and analyze the effectiveness of these actions.

Group	Stakeholders	Category
A	“Culprit” state governments	M1
B	“Victim” state governments	M2
C	“Culprit” industries	M3
D	“Victim” industries	M4
E	Regional organizations	M5
F	Global agencies	M6
G	Other “Concerned” institutions in culprit and victim states	M7
H	“Concerned” nongovernmental institutions	M8

M1–M4: Stakeholders whose share of total monetary cost is about the same as each other.

M5–M6: Stakeholders who share higher burden of the total monetary cost compared to M1–M4.

M7–M8: Stakeholders who share the lowest total monetary cost compared to M1–M6.

Table 5: Share of total monetary cost by stakeholders (Quah, 2002)

Regional Organizations

In today’s society, international and regional institutions play an increasingly important role in certain interstate affairs. These international and regional institutions have a moral, political and legal responsibility to be engaged in a well-intentioned ‘collective defense’ program of such kind. It can be seen that the members countries of ASEAN had shown interest in using ASEAN

diplomacy to bring some collective influence on the member states whose territory is the origin of polluting activities that have severely damaging transboundary effects (Quah, 2002).

Before 2002, ASEAN initiatives on the haze include detailed operational procedures for monitoring, assessment and joint emergency response; formation of a regional network made up of national focal points; an inventory of fire-fighting resources and training mechanisms; simulation exercises for joint emergency response between countries; and demonstration sites for the benefit of farmers, smallholders and shifting cultivators (ASEAN Secretariat, 2004). However, the outcomes of these early ASEAN initiatives have largely been ineffective in providing long-term, workable solutions for the transboundary haze. The focus on national plans and the lack of legally binding documents ensured that countries were largely free to pick and choose regional initiatives that best suited their national economic interests (recall that most of the commercial oil palm plantations in Indonesia are run by Malaysian and Singaporean investments alongside large local conglomerates). Hence a preventive strategy that would supplement ASEAN's present, rather weak, remedial measures in fire-fighting and other initiatives was therefore needed (Quah, 2002).

The current stage of ASEAN cooperation over the haze stands at the implementation of the ASEAN Transboundary Haze Pollution (ATHP) was brought into force in 2003 (ASEAN Secretariat, 2004). The 1997-1998 haze episode, which was the most severe haze the region ever seen had sparked renewed outcry from the public and civil society. This backlash prompted member countries to agree to establish a legally binding mechanism to address haze and appease the public and civil society. Therefore, in 2001 the ATHP was proposed to provide the legally binding support for earlier ASEAN haze initiatives (Florano, 2003).

Four rounds of negotiations for the ATHP were held between March 2011 and September 2011 (Nguitragee, 2011). Negotiations were concluded and the ATHP was signed by all ten ASEAN member countries in 2002, in Kuala Lumpur. Currently the ATHP had been ratified by nine ASEAN states, with the Philippines being the ninth country to ratify in early 2010. Indonesia remains the only ASEAN member country yet to ratify the ATHP. The Agreement's stated objective, under Article 2, is 'to prevent and monitor transboundary haze pollution as a result of land and/or forest fires which should be mitigated, through concerted national efforts and intensified regional and international cooperation'. The treaty upheld states' sovereign right to exploit their own resources pursuant to their own environmental and developmental policies (ASEAN Secretariat, 2002), good neighbourliness, international cooperation, the precautionary principle, and sustainable development (Article 3) (Florano, 2003).

With the implementation of the ATHP in 2003, specialised Technical Working Groups were tasked to develop the Comprehensive ASEAN Plan of Action on Transboundary Haze Pollution (ASEAN Secretariat, 2007). The resulting Plan of Action included a cooperation mechanism for members countries to help Indonesia prevent haze by controlling fires, establishing early warning systems, exchanging information and technology, and providing mutual assistance (Khalik, 2006).

Furthermore, a Panel of Experts (POE) was established to support the implementation of the Plan of Action. According to the Agreement, the POE 'may be utilised when taking measures to mitigate the impact of land and/or forest fires or haze pollution arising from such fires, and also for the purpose of relevant training, education and awareness-raising campaigns' (ASEAN Secretariat, 2002). The purpose of the POE was to provide rapid independent assessment and

recommendations for the mobilization of resources. These experts were then deployed to the fire sites and would provide their report and recommendations to governments to mitigate the haze problem. Article 5 of the ATHP also called for the establishment of an ASEAN Coordinating Centre for Haze in Indonesia, and a supporting ASEAN Haze Fund (Kurniawan, 2002, Hudiono, 2003), for the purposes of ‘facilitating cooperation and coordination among the parties in managing the impact of land and/or forest fires in particular haze pollution arising from such fires’ (ASEAN Secretariat, 2002).

Since the ATHP was legally binding, many had hoped that it would be a step closer to mitigate the regional haze. This was because legally binding arrangements are largely regarded in the literature as a more effective type of agreement, as it is one of the most common and traditional ways for inducing targeted participants to change their behavior (Shelton, 2003, Murray, 2010). By virtue of being legally binding, scholars like Koh and Robinson (2002) hoped that the ATHP would be able to help aggregate individual national policy positions around the joint position of the earlier ASEAN efforts and facilitate their implementation. Other scholars noted that this was a positive reflection of the willingness of member countries to put aside the taboo of interference in one another’s affairs (Jones, 2006, Smith, 2000).

However, this legally-binding document still has not been able to bring about real solutions for transboundary haze mitigation. ASEAN’s continued lack of success in dealing with the haze problem may be embedded in its diplomatic approach. It can be seen that the ASEAN approach to diplomacy is to be based on consensus building and non-interference in the domestic affairs of member states (Quah, 2002). This seemingly weak framework of non-interference has resulted in problems of monitoring and enforcement of the ATHP. For example, member states were

compelled to ensure that the ATHP, even when legally binding, still observed their national interests, as opposed to the collective regional interest. Thus even when the ATHP was legally binding, it was a highly watered down document where the costs of cooperation for concerned parties are greatly lowered. This resulted in a treaty that was vague and lacking in various hard-law instruments such as strong dispute-resolution and enforcement mechanisms. Important provisions, including those for developing preventive measures, and a national emergency response, are left to member parties to interpret and enforce (Nguitragool, 2011).

Also, issues that were deemed too ‘sensitive’ were not discussed at all during negotiations. For example, one ASEAN staff member explained that even though there was an unspoken understanding that commercial plantation burning was the major source of haze, the issue of illegal burning by local and foreign plantation companies was never raised during discussions leading up to the ATHP. As Article 27 of the Agreement states, ‘any dispute between Parties as to the interpretation or application of, or compliance with, this Agreement or any protocol thereto, shall be settled amicably by consultation or negotiation’ (ASEAN Secretariat, 2002). As a result of these negotiations, the ATHP provided only weak legal enforcement as it relies on the cooperation of its parties through self-regulation and decentralized operations, despite being legally binding (Florano, 2003).

For example, ASEAN officials explained that the strict observance of the non-interference norm within the ATHP rendered important new elements like the POE ineffective. Article 12 states that ‘assistance can only be employed at the request of and with the consent of the requesting Party, or, when offered by another Party or Parties, with the consent of the receiving Party’ (ASEAN Secretariat, 2002). Because of these non-interference requirements, there were very

specific guidelines for deployment by the Indonesia government. These guidelines had specifically mentioned that the POE team leader has to be an Indonesian, and there has to be evidence of more than 250 hotspots over a period of two days. As a result, the POE was deployed only three times; to Indonesian provinces between August and October 2006 (Prasiddha, 2009). Indonesia also on several occasions deny or delay the entry of the POE, with the recent occasion occurring in 2009, even though all criteria for activation has been fulfilled. This enabled Indonesia to avoid opening its doors to unwanted external scrutiny of its internal and commercial practises. Thus, just like other haze initiatives before it, non-interference was strictly adhered to with the ATHP as a way to ensure that crucial economic interests of the involved states were preserved.

Furthermore, Indonesia's self-interested non-ratification of the ATHP has been a major stumbling block for the effectiveness of the Agreement. Due to the non-interference norm, neither the ASEAN Secretariat, nor any member country could question or pressure Indonesia on the issue of ratification. The observation of the ASEAN Way in haze initiatives has allowed Indonesia to assert its sovereign right in selectively adopting or ignoring elements of the ATHP in ways that protect its crucial economic interests (Nesadurai, 2008).

Hence, these initiatives that were strategically shaped in the spirit of the ASEAN Way resulted in an ATHP that still enhances the power of the government (Hurrell, 1995), protects crucial national economic interests (Nesadurai, 2008), preserves state sovereignty, and deflects responsibility on the haze issue. Even the legally binding ATHP has failed to produce effective results for haze mitigation in the region, where ASEAN is still not fully able to supplement the inherent weaknesses in the political, administrative and legal systems of Indonesia (Quah, 2002).

State governments and industries

The second group of stakeholders that should carry significant burden for haze mitigation in the region should be the culprit and victim state governments and industries (see Table 5) (Quah, 2002). While the ‘polluter-pays’ principle states that a country should pay compensation to a neighbouring country if activities in its territory cause substantial transboundary damage in the territory of the latter is a well accepted concept in international environmental law, it is highly suggestive of faultfinding and blame which in turn, emphasizes confrontational measures to resolve the problem. Hence this ‘polluter-pays’ principle is very nontraditional in an ASEAN setting and a more traditional Coasian solution would be one where the victim pays the perpetrator to stop or reduce its activities. In order for cash-strapped Indonesia to be able to stop or reduce the haze, it would have to increase its fire-fighting capability and resources including enforcement measures, all of which inevitably require sufficient funds to be carried out. The ‘victim’ countries will want to estimate their respective losses if the haze problem remains unabated as against payment of a sum of money to the ‘perpetrator’ countries—in this sense, primarily, Indonesia—to reduce the forest fires. For the victim countries, it certainly would be ‘cheaper’ to make such payments (if the sum paid is less than the economic losses sustained) and can be seen as efforts to promote ASEAN friendship in the presence of difficulties faced by its member countries. However, a concern with such arrangements would be the extent of the ‘loss of-sovereignty’ price the Indonesian government would be willing to pay in order to attract such an externally funded program in fire prevention and control (Quah, 2002).

Indeed such arrangements were implemented and took the form of collaborative projects between the culprit and victim governments, known as ‘Adopt-A-District’ programmes. In

November 2006, the Indonesian government proposed the idea of these programmes to a sub-regional Association of Southeast Asian Nations (ASEAN) meeting on haze in Cebu, in the Philippines. Indonesia invited the four other members of the sub-regional meeting (Malaysia, Singapore, Thailand and Brunei) to ‘adopt’ some of its fire-prone districts to assist local governments in strengthening their haze prevention and monitoring capacities (Nguitragool, 2011), and to implement measures to prevent and suppress land and forest fires (Asmarani, 2006, Lee, 2006a, Lee, 2006b). Following this, Malaysia committed to assist Riau, where most of the haze that spreads to Malaysia originates from, and Singapore committed to Jambi based on the same reasoning (Parliament of Singapore, 2006, McIndoe, 2006, Peh, 2006, *The Straits Times*, 2006, Khalik, 2007). Under this MOU, Malaysia would provide US\$ 670,000 worth of community training and capacity building projects, peatland rehabilitation assistance, and install a haze early warning system in the province (Global Environment Center, 2010), while Singapore would provide US\$ 831,000 to Jambi for similiar programmes over a period of two years (National Environment Agency, 2009). The sum of money for the programme are then indeed lesser than the economic losses sustained by these countries as seen in Tables 2 and 3 above.

The Malaysia-Riau collaboration

The Riau province is located in Central Sumatra and has a population of 5.5 million people with a land area of 7.3 million hectares (see Figure 4). Currently 1.4 million hectares have been converted to palm oil plantation land, whereby a substantial amount of which is controlled by Malaysian companies. For example, the major Malaysian government-linked company (GLC), Tabung Haji Plantations owns the development rights to 150,000 hectares of land and Kuala

Lumpur Kepong owns 27,760 hectares of plantation land in Riau (WALHI et al., 2009). PT Minamas, a subsidiary of the Sime Darby, another major Malaysian GLC, also has land holdings there as well.

Upon approval of the Adopt-A-District project from the Malaysian Cabinet, Malaysia had sent a fact-finding mission to the Riau province in April 2007 (Bahagian Udara, 2010). With the results obtained from the mission, Malaysia had then developed a plan of assistance that was presented to the sub-regional meeting in Jambi, Indonesia in June 2007 (Ghani, 2007b). In June 2008, Malaysia and Indonesia signed a Memorandum of Understanding (MOU) on Haze Management in the Riau Province in Sumatra that remains in force for five years from the date of signing; until June 2013.

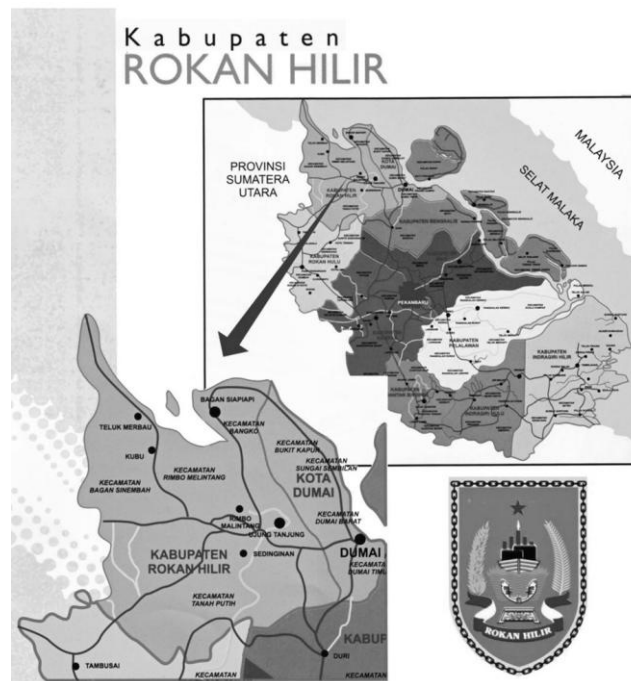


Figure 4: Map of Riau province with detail of Rokan Hilir regency (Pemerintah Provinsi Riau, 2010)

The key elements of the MOU include canal blocking and water storage wells for fire prevention and control, enhancing community outreach and partnership development, community training and socialization for peatland management, development of awareness material for the community, and establishing community patrol teams for fire prevention and control (Global Environment Center, 2010). Indonesia in return was required to facilitate Malaysia's access to these areas so that the projects could be carried out.

Activities under the Malaysia-Riau MOU focussed on two sub-areas in the small regency of Rokan Hilir in Riau, involving six specific villages. The first phase of this MOU project saw community leaders and farmers from Rokan Hilir being invited by the Malaysian Department of Agriculture to Selangor, Malaysia for a training workshop on zero burning techniques in July 2008, and also a community fire fighting training project in Riau in August 2008. However, these projects were not well-received by the community. For example, at the training workshop in Riau, no members of the community attended. Attendees were mostly made up of officials from both countries. As explained previously, satellite data has indicated that an estimated 80% of the fires were set by plantation companies, while only the remaining 20% of the fires were set by villagers. Hence villagers did not support this programme as they were angry about being unfairly targeted by Malaysia for causing the haze. (Dauvergne, 1998, Casson, 2002).

Due to the failure experience in the first phase of MOU project and the lack of expertise, the Malaysian Department of Environment (DOE) had chose to sub-contract out the following five pilot projects to a Malaysian-based NGO called the Global Environment Centre (GEC), under collaboration with Jikalahari, a local Indonesian NGO, during the time period of December 2008 to November 2009. GEC was then qualified as they had expertise in peatland management and

was previously involved in the ASEAN Peatland Management Initiative 2001 (Bahagian Udara, 2010).

However another obstacle faced during this period of time were the Malaysian plantation companies operating in Riau like Tabung Haji and Kuala Lumpur Kepong as they were reluctant to be involved in these projects. When GEC approached them to enhance their role and cooperation with local authorities to address forest fires, the companies were reluctant to participate on the pretext that they 'do not burn' the plantations. They were afraid that participation would portray an acceptance of guilt and that only one Malaysian company, PT Minamas (under Sime Darby) agreed to participate. However, PT Minamas only carried out what they called 'socialization' projects for smallholders in and around their plantation, instead of any inward-looking improvement of their own activities. These socialisation projects involved spreading awareness on fire prevention, training, and demonstrations of alternative profitable techniques of clearing land among villagers.

Even with the lack of the participation from the plantation companies, the other GEC projects did produce some significant achievements. These include the introduction of canal blocking to villagers for better water management, and the translation of awareness material into the Indonesian language. It was also reported that there were significant change of attitudes at the community level towards adopting zero burning practises and alternative livelihoods, especially towards pineapple farming in lieu of small-scale oil palm cultivation (Bahagian Udara, 2010). In addition there were no records of fire reported in the Rokan Hilir regency throughout the project period from January to November 2009 (Global Environment Center, 2010).

As a result the Malaysian government regarded the projects carried out under the MOU as a success. Malaysia commended the programme by stressing that focussing community-level projects was key to solving open burning issues. However, NGOs and academics did not share the same optimism. A major problem that was identified was the overwhelming focus on smallholders (and only in the small area of Rokan Hilir too) rather than commercial plantation companies (identified as the ‘culprit’ industries) in Riau. Official documents on the project justified the problem by stating that ‘the involvement of the local community in fire prevention efforts was deemed the most strategic and effective as they were identified as the main actors for problem resolution’ (Global Environment Center, 2010), without acknowledging the even larger role of commercial plantations. Malaysia’s biased focus further contributed to the weak reception of these projects by the target community, as villagers were unhappy and alienated for being unfairly targeted by Malaysia even when the government knew that the source of the fires were mainly from politically important plantation companies. As a result of all this, the outcomes of the Malaysian projects failed to address the real source of the problem.

Despite positive reviews by the Malaysian government representatives, after one year, the Malaysian DOE decided not to implement additional projects under the MOU, which was supposed to run for five years. DOE officials explained that this was due to budget cutbacks resulting from the recent financial crisis of 2008, even though they had obtained the funding for all five years of the project as it was already being already pre-approved by the Ministry of Environment and Natural Resources. Malaysia’s decision to discontinue funding for the project was also in fact a result of an altercation between Malaysian and Indonesian representatives. The Indonesian representatives felt that they had learnt sufficiently from Malaysia during the first round of projects, and thus requested for the budget and resources for the following projects to

be channelled directly to the central government in the hope that they could implement the projects themselves without having to rely on the Malaysian government. However, Malaysia was unwilling to change their hands-on approach, most probably for fear of Indonesian interference of Malaysian plantation interests in the area, resulting in an impasse where future projects were suspended.

The Singapore-Jambi collaboration

The Jambi province is located in Southern Sumatra and has a population of 2.7 million with a land area of 5.3 million hectares (see Figure 5). 92,000 hectares have already been converted to oil palm plantation (Anonymous, 2009). Singapore's Golden Agri Resources is a major landowner in the province (Munadar et al., 2010). It can be seen that similar outcomes were observed for the Singapore-Jambi collaboration as well.

Singapore had conducted a fact-finding mission to the region and also hosted officials from the Indonesian Ministry of Environment and the Jambi Provincial Government for a bilateral workshop to put together the framework of the master plan in January 2007 (Parliament of Singapore, 2007, Selamat, 2007, Tan, 2007, National Environment Agency, 2009). Based on the findings and the workshop, a letter of intent for the Framework for a Master Plan to Prevent and Mitigate Land and Forest Fires in the Muaro Jambi Regency was presented to Indonesia in early 2007 (*Channel NewsAsia*, 2007c, Ghani, 2007a). Like the Malaysia-Riau collaboration, this collaboration was limited to only one out of the nine regencies in the province, namely Muaro Jambi.



Figure 5: Map of Jambi province (PNPM-PSIEW, 2009)

Under the master plan, Singapore would assist in funding, providing technical expertise, and assist to implement seven specific haze-mitigation programmes at the community level (National Environment Agency, 2009). This include providing technical equipment (two fire danger rating stations), training officials to interpret satellite pictures, and reviewing the regency's fire-fighting capabilities (Parliament of Singapore, 2006, *Channel NewsAsia*, 2007a, Chow, 2008, Mulchand, 2007a). More extensive follow up programmes included training villagers on alternative land clearing methods (Parliament of Singapore, 2006), aquaculture training to encourage farmers to switch to farming fish (to reduce the need for slash-and-burn) and water management programmes to increase water levels in peatlands to prevent fires (Liaw, 2008). On November 2007, Indonesia had approved Singapore's letter of intent for Jambi (*Channel NewsAsia*, 2007b, Mulchand, 2007b, Chow, 2008). Since 2010 and eight action programmes have been completed since (Parliament of Singapore, 2010).

As a result of these programmes, Singapore had reported that there were no fire incidents in the Muaro Jambi area in 2009 (Parliament of Singapore, 2009, Huang, 2009) and that fire incidents in the whole Jambi region went down by 23% in the two years since Singapore's involvement

(Gunasingham, 2009). The Singaporean Minister of Foreign Affairs then commented that this ongoing cooperation, based on ‘genuine friendship and close relationship built up over the years between officials from both countries’ had helped reduce the haze problem since 2006 (National Environment Agency, 2009, *Singapore Government News*, 2010b). However, upon completion of the projects, the Ministry of Environment and Water Resources announced that, while it would be willing to share ‘expertise’ with other provinces, it would not be extending its projects to other provinces due to budget limitations (Parliament of Singapore, 2009). The real reason for this withdrawal of funding however is most probably similar to Malaysia’s reason; because Indonesia had wanted funding to be channelled directly to the central government instead.

The outcomes of the Singapore-Jambi projects have also been criticised. Among it was that the project’s effectiveness was limited due to the small size of the designated Muaro Jambi area. Also, one major project that involved introducing dyke systems in peatland areas to collect water to use in case of fire had the side effect of drying out the peatlands, and essentially prepared them for plantations. This may have been due to Singapore’s lack of expertise in managing peatlands. This of course worked out to the benefit of commercial oil palm plantations, including Singapore’s Golden Agri with its substantial landholdings there. Another shortcoming of the project was the lack of participation from the ‘culprit’ industries. Only one Singaporean plantation company was willing to get involved in these projects, through village socialization programmes. However, just like the Malaysia-Riau projects, these socialization plans did not involve any inward operational scrutiny. A Singaporean opposition MP thus commented that the ATHP and its related Adopt-A-District programmes should not have just been limited to public education and putting out fires at the community level, instead it should have focused on training plantation owners who were the major cause of the fires (Parliament of Singapore, 2007).

As a whole, both the Malaysia-Riau and Singapore-Jambi projects were able to boast an improved reduction in terms of number of hotspots and fires in these respective areas. However, this could also be credited to the El Niño cycle over the past few years that did not bring severe drought to the region. More importantly, these projects only focused myopically on smallholders, bringing about short-term, site specific results and not more important broader long-term policy mechanisms. By being involved the collaborations, Malaysia and Singapore were able to show that they were being proactive, while continuing to focus on elements that did not affect their plantation business interests in Indonesia. Therefore, these projects, along with the other ASEAN level haze initiatives discussed above, can be seen as mere rhetoric and half-hearted efforts by all parties concerned in response to heightening civil society concerns about the haze, with little emphasis given to actual effective haze mitigation (Chang and Rajan, 2001).

Indeed, the short time frames and rhetoric value of the projects became clear with governments expressing their disinterest in the continuation of similar collaborative projects once the initial projects were deemed ‘successful’ (Parliament of Singapore, 2009). Clearly, Indonesia was not willing to pay the price of the loss of sovereignty related to such opening up of its internal activities to external agents, something that is to be expected among Southeast Asian countries observing the ASEAN approach of engagement based on non-interference in the domestic affairs of other member countries.

Conclusion

Haze continues to be a recurring event in the region, with the recent episodes in July 2009 (Then, 2009), October 2010, and throughout 2011 to 2012. It can be concluded that mitigation efforts for the Southeast Asian haze has roughly followed the stakeholders’ approach to cost sharing as

proposed by Quah in 2002 (see Table 5), but with limited success. In the stakeholders' approach to mitigate the Southeast Asian haze, regional organizations (M5) and global agencies (M6) are expected to share the highest burden of the total monetary cost for mitigation. Indeed, ASEAN as Southeast Asia's most prominent organization has been the most active agency involved in haze mitigation. Even though ASEAN's Coasian efforts suffered from significant weaknesses as seen in the report, it may be premature to write off the potential of this regional body. It should be noted that the haze is a relatively recent phenomenon. Hence finding a concrete solution would undoubtedly take time (Quah, 2002). One good example would be the acid rain in Europe whereby the successful mitigation of acid rain had spanned a period of about 40 years (Johannessen, 2009).

There has however been relatively less involvement from global agencies in the matter. This is expected as it is not realistic that these global institutions would wish to make such major contributions without having a significant degree of influence over the use of resources donated (Quah, 2002). As mentioned above, the ASEAN approach of engagement based on non-interference severely limits the possibility of such arrangements. Without a significant shift in the nature of ASEAN engagement, there would be many constraints faced and many avenues to mitigate the haze problem will remain untapped.

The groups of stakeholders who would share a slightly lower burden of monetary costs compared to M5 and M6 are 'culprit' state governments, 'victim' state governments, 'culprit' industries, and 'victim' industries. The report had then detailed the Adopt-A-District programmes that display collaboration between the culprit (M1) and victim (M2) state governments. However, as discussed above, while these projects have been useful in promoting ASEAN friendship in the

presence of difficulties faced by its member countries, this exercise has not been ‘cheaper’ on the victim states as they have not been able to offset the economic losses sustained from the haze through contributions to Indonesia in the long run. Instead, they continue to sustain economic losses on top of the expenses incurred for these projects. This may explain why neither of these programmes was continued beyond their first projects by both Singapore and Malaysia government. It would have been far more economical for Malaysia and Singapore to compensate directly to the victims industries and individuals instead (Quah, 2002), while Indonesia concentrates on reform that will improve their political and bureaucratic weaknesses and strengthen the mandate of relevant agencies to police these instances of fires.

A major weakness in these collaborations was the unwillingness of the culprit industries (M3) (in this case the local, Malaysian and Singaporean commercial oil palm plantations) to get involved. While up to now, the fact that many of these fires are often undertaken by local or foreign government sponsored and/or protected companies have rendered these parties almost untouchable when it comes to haze mitigation activities. Governments need to place more pressure in corporate boardrooms under their jurisdictions to accept an appropriate degree of responsibility for combating haze (Quah, 2002). There is also a conspicuous absence of involvement from victim industries (M4), like health, tourism, and local ancillary businesses, which can also be encouraged according to their capabilities to participate in the haze mitigation projects as well.

Other ‘concerned’ institutions in culprit and victim states (M7) and ‘concerned’ nongovernmental institutions (M8) who should share the lowest monetary cost should also be able to contribute primarily through nonmonetary value. Indeed, local and international environmental NGOs like Wahana Lingkungan Hidup (WALHI), Jikalahari, World Wide Fund

for Nature, and Milieudefensie have been continuously contributing in a non-monetary fashion through programmes and publications aimed to increase awareness of the public, and pressure on the private sector and governments on the haze issue.

To sum it all, the haze is a multifaceted issue that calls for careful considerations from several perspectives. Ultimately, the question of who should pay depends on the extent that different parties suffer because of the haze. An optimal solution will only result when the different countries are willing to overlook their national economic interests and acknowledge the transnational effects of the haze (Quah, 2002). Without monetary and nonmonetary contributions from all categories of stakeholders, the problem of regional haze in Southeast Asia seems to have a slim chance for resolution.

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