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POLICY BRIEF:
Coping with Recurring Haze Episodes in Malaysia

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Policy Problem:

Recurring forest fires in the island of Sumatra, Indonesia bring heavy smoke to and cover Penang in haze almost every year, causing detrimental effects on our people's health.

Recommendations:

Short-term	1. Inform and keep the public alert. <ul style="list-style-type: none">- Develop official mobile applications where people can track latest API on cellphones; send alerts via the applications or SMS to urge the public stay indoors if API exceeds 150.- Create an official website to aggregate and publish haze information, including hourly API readings, daily data generated from the Southeast Asia Fire Danger Rating System (FDRS), recommended medical measures and precautions to cope with haze
	2. Distribute free facemasks to low-income households; Make available air purifiers to every household with affordable prices or subsidies.
	3. Set up a systematic set of emergency counter-measurements. <ul style="list-style-type: none">- Ban open burning activities and palm oil trees, limit heavy industrial production activities during haze episodes.- If API level exceed 100, initiate use of N95 respirators by employees working outdoors and facemasks for students; reassign susceptible individuals from outdoor to indoor jobs.- If API level exceed 200, cancel schools and non-essential places of work in the private and public sectors; the lost day can be made up when haze events are over.- If API readings exceed 300 for a consecutive of three days, launch cloud-seeding operations to encourage rainfalls.

	4. Send firefighters to and provide firefighting equipment for Indonesia to when large-scale fires break out.
Long-term	5. Levy taxes on palm oil companies and heavily fine or shut down those actively or passively engage in illegal burning activities in Indonesia.

Background:

Cross-border haze has been a recurring problem in the Strait of Malacca since the 1980s. Whereas large-scale forest fires mostly happen in Indonesia as a result of local slash-and-burn way of forest clearing for plantations, smoke and haze are brought to us by prevailing winds.

Analysis:

Recommendation 1 & 2: It takes time for fires in Sumatra to develop and for the smoke from Indonesia to arrive Penang. Whereas we can't do much about the fire itself, precautionary measures can mitigate its harm on public health. Drawing from Singapore's lessons where panicked buying led to facemask shortage and overcharging¹, we should keep the public informed about API level and get them prepared for predictable haze. Similarly, releasing the FDRS data can give the public a sense of the potential scale of fires in Indonesia and anticipate whether there will be a haze in coming days. Meanwhile, if fires do break out in Indonesia, it would be easier and more efficient to control fires if we offer help and take joint operations to Indonesian government.

Air filters and purifiers have been recommended as a potentially useful mitigation measure. Take Singapore as an example. Its Ministry of Environment assessed portable air cleaners and found that several models were able to reduce the level of fine particles in a typical living room or bedroom to an acceptable level when there was an intense haze episode².

Recommendation 3: Much as our haze is brought by fires in Indonesia, some of the of air pollutants sources are also localized. These include power plants, industrial waste incinerators, cement plants, iron and steel mills from the industrial and suburban areas, the clearing and burning of old palm oil trees in plantations, emissions of dusts from urban constructions and quarries, and open burning at some solid waste dumpsites³. When facing continuous haze events, we should limit domestic polluting activities for the sake of health. Incentives might be provided to local producers and companies for abiding by these regulations.

Admittedly, such bans and the cancellation of schools and work will halt domestic production and disrupt business activities. However, such loss is inequitable to the

¹ <http://singaporeseen.stomp.com.sg/singaporeseen/singapore-hit-by-haze/blatant-overcharging-for-n95-masks-continues>

² <http://www4.gov.sg/env/sprd/haze-rel-22-98.htm>

³ http://www.wpro.who.int/environmental_health/documents/docs/UKM_Report.pdf

damage on and cost of public health in face of haze. According to the Economic and Environment Programme in Southeast Asia and WWF, the haze of 1997 cost the people of Southeast Asia some USD1.4 billion, mostly in short-term health costs. More than 40,000 persons were hospitalised for respiratory and other haze-related ailments. We should therefore take hard-line counter-measurements during haze episodes. Cloud-seeding causing rainfalls has been proven quite effective in many places to disperse and “wash out” air pollutants⁴. Though costly, such method is useful and necessary when the haze shows no sign of moving away.

Air Quality Index Levels of Health Concern	Numerical Value	Meaning
Good	0-50	Air quality is considered satisfactory, and air pollution poses little or no risk.
Moderate	51-100	Air quality is acceptable; however, for some pollutants there may be a moderate health concern for a very small number of people who are unusually sensitive to air pollution.
Unhealthy for Sensitive Groups	101-150	Members of sensitive groups may experience health effects. The general public is not likely to be affected.
Unhealthy	151-200	Everyone may begin to experience health effects; members of sensitive groups may experience more serious health effects.
Very Unhealthy	201-300	Health alert: everyone may experience more serious health effects.
Hazardous	> 300	Health warnings of emergency conditions. The entire population is more likely to be affected.

Chart 1 Air Quality Index⁵. In the case of our API rating system, readings within the 51 to 100 range indicate “moderate” air quality, while 101 to 200 point to “unhealthy” conditions. Measurements between 201 and 300 represent a “very unhealthy” status, while readings above 300 indicate “hazardous.”

Recommendation 4 & 5: In Indonesia, a major source of smoke are fires set on palm oil and rubber plantations⁶, primarily in Sumatra, to get rid of old trees and to clear land for new plantations. Report shows that roughly half of the fires are burning on land managed by pulpwood, palm oil, and logging companies.

⁴ http://www.met.gov.my/index.php?option=com_content&task=view&id=70&Itemid=160

⁵ http://cnx.org/contents/4bdb3eee-e60d-4842-adfb-65f878015e0a@1/Rice_Air_Curriculum_-_Lesson_5

⁶ http://www.fire.uni-freiburg.de/iffn/country/id/id_24.htm

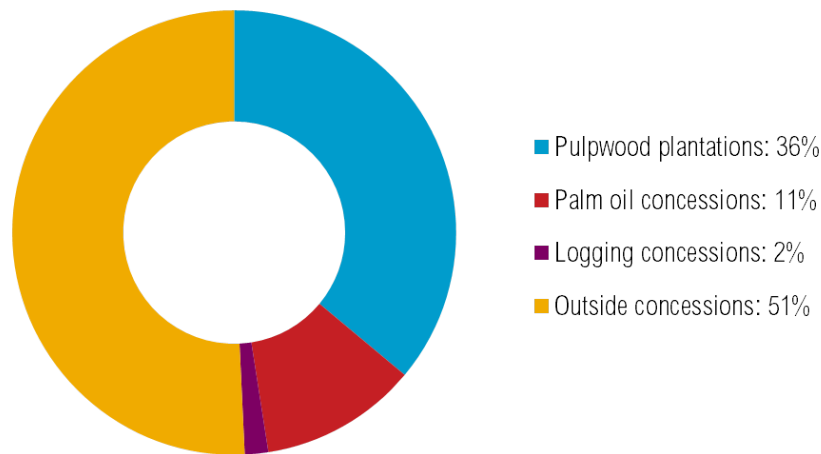
Yet, we should not ignore the fact that a number of these are local subsidiaries of Malaysian companies. Despite a “zero-burning” policy in Indonesia, law-enforcement there is weak and requires regional cooperation when dealing with multinational companies. Concerted efforts to discourage palm oil burning and other activities related to forest and peat-land fires are therefore needed.

Costs Implications:

Mobile applications development and creation of a website	\$500,000
Procurement of facemasks for low-income households (roughly 20 percent of the total population)	\$3.5 million
Cloud-seeding projects	\$11 million

Appendix:

Figure 4: FIRE ALERTS BY LAND USE TYPE, SUMATRA, INDONESIA
February 20-March 12, 2014



Source: NASA Fire Information for Resource Management (FIRMS) Active Fire Data, February 20-March 11, 2014
This dataset includes only fire alerts with a confidence level greater than or equal to 30% and brightness greater than or equal to 330K
Concession (pulpwood, oil palm, and logging) data from Indonesian Ministry of Forestry, 2013