

Solving the Seasonal Haze Problem

The cost of tackling the haze should be shared by the affected countries in proportion to the losses they experience

Tackling haze with cost sharing

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THE seasonal haze in South-east Asia, caused by fires to clear land in Indonesia, has affected air quality in neighbouring Singapore and Malaysia for years and become an almost annual occurrence.

Severe haze is expected again this year because of the likely drought caused by the cyclical El Niño weather pattern. In fact, the Singapore Government has reportedly stocked a huge number of face masks as a precautionary measure.

Tradable pollution rights?

SINCE the haze is a case of transboundary pollution, most of the conventional tools for controlling pollution cannot be applied. The key sticking point is the sovereignty and independence of both polluted and polluting countries.

Professor Roland Coase, in an important paper that helped him win the Nobel Memorial Prize in Economic Sciences in 1961, argues that assignment of tradable pollution rights to either the polluter or the polluted can lead to optimal control of pollution.

He asserts that optimal control of pollution can be achieved irrespective of whether the polluter has the right to pollute or the polluted has the right to clean air. Since the right to pollute is a property right that has value, if the right is tradable, the result will be optimal control of pollution at least cost to society.

In the case of South-east Asian haze, however, the Coasian solution cannot be applied as there is no supranational authority to assign and enforce pollution rights. A polluting country can be pressured but not forced to reduce its pollution.

Therefore, only voluntary negotiations among the affected countries can solve the problem.

Since Singapore and Malaysia cannot enforce their right to clean air, the South-east Asian haze is a case in which the polluting country, Indonesia, has the right to pollute. A 2002 agreement to get Asian countries to implement measures to prevent forest fires has failed. Of the 10 member states, Indonesia is the only country which has yet to ratify the



Asian Agreement on Transboundary Haze Pollution.

Prerequisites for success

TO BE successful, a regional agreement must take into account several factors.

First, no country should be worse off after the agreement is implemented. This can be ensured if the cost of controlling pollution is smaller than the total damage that the affected countries suffer from pollution.

The cost of controlling pollution can then be distributed in such a way that each country is better off. By this we mean that each country's share of the cost is smaller than the damage it would have had to suffer if pollution were not controlled.

Estimates of the cost of the haze to South-east Asia vary, but a conservative estimate made by the Asian Development Bank (ADB) was US\$9 billion for the 1997 episode.

No similar estimates for the cost of controlling and preventing fires that lead to haze are available.

But a rough estimate can be obtained by taking into account the average number of hectares that are cleared by fire each year and the average cost of clearing a hectare

by non-burning methods. An educated guess for these costs is approximately US\$1.2 billion (S\$1.5 billion).

The second factor to be considered when formulating a region-wide agreement is that no group of countries should be better off by leaving the agreement. Clearly, the two non-polluting countries - Singapore and Malaysia - would only be better off by leaving the agreement if the amount they pay to control the haze is higher than the damage it causes.

The agreement should also be such that neither Singapore and Indonesia, nor Malaysia and Indonesia, can be made better off by leaving the multilateral agreement and establishing a separate bilateral accord.

The third prerequisite of a successful agreement is that it should not be possible to draw up an alternative agreement such that no country is worse off, but some country or countries are better off.

Game theory

THERE is a branch of game theory concerned precisely with the problem of designing such agreements. It has been shown that if the cost of controlling pollution is shared by the affected countries in proportion to the damage they

experience from pollution, the three above-mentioned conditions for a successful agreement can be satisfied.

This cost-sharing rule has come to be known as the Chand-er-Tulkens rule.

An earlier study by Professor Euston Quah and others, published in the 2004 issue of British-based academic journal Environment and Planning, has estimated the relative impact of the haze on Indonesia, Malaysia, and Singapore to be 93.8 per cent, 5.1 per cent and 1.1 per cent, respectively. Thus, the Chand-er-Tulkens rule requires Indonesia, Malaysia and Singapore to contribute to the cost of controlling the haze in the same proportions.

Since the estimated cost is US\$1.2 billion, Indonesia, Malaysia, and Singapore should contribute approximately US\$1.125 billion, US\$61.2 million, and US\$13.2 million a year, respectively.

The sum of US\$1.125 billion a year may seem to be a huge sum for a developing country like Indonesia. But it is much smaller than the approximately US\$1.4-1.7 billion damage a year that it will be able to avoid.

Implementation

THERE may, of course, be some

practical difficulties. The countries will need to agree on how the US\$1.2 billion should be deployed.

One approach could be to use the money to enhance the ability of the Indonesian authorities to detect, locate and respond to the fires, as well as strengthen its ability to prosecute those responsible.

Another approach could involve paying subsidies to encourage land clearing by non-burning methods.

Perhaps a combination of two of the approaches would work best. Commonly heard suggestions to control fires and the haze, such as boycotting Indonesian products (products made from palm oil, for example), will not work. They simply penalise well-behaved plantations as well as errant ones.

Furthermore, palm oil products may also be used as intermediate goods in the production of final goods, in which case the approach also penalises other firms that are not complicit in the fires.

The recently suggested imposition of a strict liability law with regard to fires emanating from plantations is a step forward simply because it incentivises plantation owners to be aware of their actions.

But the strict liability law proposed by Singapore only applies

to Singapore-owned plantations. Besides causing haze, the fires are the largest single contributor to Indonesia's greenhouse gas emissions.

In 1997, the haze episode over the three-month period actually exceeded the annual carbon emissions of Europe.

Since Indonesia has committed to reduce its greenhouse gas emissions by 26 per cent (or 41 per cent with international assistance) by 2020, it would make perfect sense for Indonesia, Malaysia and Singapore to join forces to promote clearing of Indonesia's land by non-burning methods as a project under the clean development mechanism provided for in the Kyoto Protocol.

Any international assistance received for the project could be subtracted from the cost of controlling and preventing fires in Indonesia.

Only the net cost need be shared by the three affected countries in the proportions proposed above, thus benefiting them all.

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