



*Strengthening local capacity
in the economic analysis
of environmental issues*

The Economy and Environment Program for Southeast Asia (EEPSEA) was established in May 1993 to support training and research in environmental and resource economics across its 10 member countries (i.e., Cambodia, China, Indonesia, Lao PDR, Malaysia, Myanmar, Papua New Guinea, the Philippines, Thailand, and Vietnam.) It aims to strengthen local capacity for the economic analysis of environmental issues so that researchers can provide sound advice to policy makers.

EEPSEA Policy Briefs summarize the key results and lessons generated by EEPSEA-supported research projects, as presented in detail in *EEPSEA Research Reports*. *EEPSEA Policy Briefs* and *Research Reports* are available online at www.eepsea.org

What Impact is the Haze Having on Peninsular Malaysia?

Over the last 35 years, haze has regularly affected Malaysia. This type of air pollution has come from multiple sources, including local traffic emissions and forest fires in Indonesia. It has had a significant impact on the health of many Malaysians and on the economy of the country. To provide an assessment of the impact of the haze, a new EEPSEA study has investigated the impact of a significant haze incident that took place in 2013.

The study is the work of Dr. Mohd Shahwahid H.O. from Universiti Putra Malaysia. It found that the haze had a significant effect on the majority of households in eight Malaysian states. The total economic cost of the haze was estimated at MYR 1,494.4 million. Despite this significant impact, the study found that Malaysians appear to have become used to haze, and they tend to continue with their lives as normal when haze occurs. This state of affairs is reflected in the finding on Malaysians' low willingness to pay for insurance to mitigate the impact of the haze.



A summary of EEPSEA Research Report No. 2016-RR3:

"The Economic Value of the June 2013 Haze Impacts on Peninsular Malaysia,"
by Mohd Shahwahid H.O. Comments should be sent to: Dr. Mohd Shahwahid H.O., Professor,
Department of Economics, Faculty of Economics and Management, Universiti Putra Malaysia,
43410, Serdang, Malaysia. Tel: 160389477742. Email: mohdshahwahid@gmail.com

The history of the haze in Malaysia

The first significant haze incident in Malaysia occurred in April 1981. This event impaired visibility and disrupted flights and marine activities. The second severe haze episode occurred in September 1982 and affected Petaling Jaya in Selangor. The 1990s saw four major haze periods. The worst was in 1997–1998 when the drought caused by the El Niño weather phenomenon led to major fires in Indonesia. This haze spread to Malaysia, Singapore, and South Thailand, and caused more than USD 9 billion in losses to tourism, transportation, health, and farming.

In the 2000s, the first haze period occurred in August 2005, and it affected Port Klang and Kuala Selangor. This was followed by an incident in 2006, which affected most parts of Malaysia including eastern Sarawak and the western and southern parts of the Malaysian peninsula. There was another minor incident in 2009. This was followed by the October 2010 haze, which affected the southern peninsular states of Johor and Malacca.

The haze hit again in 2013, beginning in the month of June. Throughout the months of

June and July, the haze rose to unhealthy levels for several days at a time. This pattern continued until the rainy season in November. The haze in June 2013 was of such a magnitude that it reminded Malaysians of the previous significant haze episodes in 1997 and 2010.

Collecting information on the 2013 haze

To get the background information required for this study, government agencies were asked for relevant statistics for all the districts of Peninsular Malaysia in 2013. Data on the frequency and intensities of haze during the period May to September 2013 were obtained from the Department of Environment, while data on rainfall intensities was purchased from meteorological stations.

It was found that during the haze of 2013, the API (Air Pollution Index) and PSI (Pollutant Standard Index) readings in several states of Peninsular Malaysia and in Singapore reached record highs that exceeded the levels experienced during the 1997 haze. For example, in Malacca City, the haze lasted from the 13th of June (API reading of 62) to the 30th of June (API = 60). During this time

there were two pollution peaks: on the 21st (which saw a “very unhealthy” API reading of 223) and on the 24th (which saw a hazardous reading of 385).

Malaysia closed schools in many parts of the country because of the pollution, and the government declared a state of emergency in two southern areas after the pollution indices spiked. The high haze levels eventually led Indonesia to apologize to Malaysia and Singapore for the hazardous air pollution caused by the smoke from forest fires, which were caused by the clearing of land for oil palm plantations.

Interviewing those affected by the haze

Information on the impact of the haze on Malaysians was gathered using structured interviews with households. These were carried out in the eight states of Peninsular Malaysia that were thought most likely to have faced serious haze incidents. The survey, which involved 360 households, was undertaken in the last week of August and in the first week of September 2013; this was after the haze had dissipated and air pollution levels had returned to normal. The questionnaire obtained details of the way in

Table 1. Economic valuation methods adopted to assess the haze impacts

Forms of Impact	Valuation Methods	Data Used
Medical illnesses	Cost of illnesses Contingent valuation	Haze-related sicknesses and productivity losses Medical treatment Health-related inconveniences
Closure of businesses and offices	Opportunity cost	Loss of business opportunities and sales
Inconvenience related to travel, health, and economic activities	Contingent valuation	Willingness to pay an insurance premium to cover against the inconveniences
Masks	Expenditure method	Number and price of masks purchased

which households perceived the haze and how they reacted to it in terms of their behavior and spending patterns.

To allow the value of the haze to be evaluated, the survey asked about the health impacts of the haze, including details of any haze-related illnesses that household members had experienced (information was gathered on illness types, intensities, durations, and associated costs). Survey respondents were also asked if they had undergone medical treatment and if so, whether this had involved self-treatment or if treatment had been received from a formal medical center.

The impact of the haze on productivity

The impact of the haze on productivity and on people’s quality of life was also assessed. For example, survey respondents were asked whether the haze had caused them to miss any opportunities to go to work or earn an income. They were also asked if the haze had inconvenienced them with respect to their travel or other routine activities. Information was also collected on the expenditure that people had to make to reduce the health impact of the haze and to mitigate the inconveniences it had caused.

The information gathered from the questionnaire was used to carry out a number of different valuations of the impact of the haze. For example, the cost of illness (COI) approach was used to assess the economic value of the health impacts of the haze. The contingent valuation method was used to ascertain the value that household respondents placed on clean air. As part of this assessment, respondents were asked whether they would be willing to pay for an insurance premium payment to cover their family against any inconvenience or decline in quality of life due to a future haze incident.

The health and lifestyle impacts of the haze

The haze caused significant inconvenience and hardship among Malaysians. It also affected tourism and economic activities, such as hawking, night markets, and outdoor activities. Over 290 survey respondents (over 81% of all respondents) were affected by the 2013 haze. The major impacts related to people’s health and their lifestyles.

Health-related haze impacts affected over 73% of the respondents. The main health impacts were eye irritations (which affected over 36% of the respondents), coughing

(which affected over 37%), blurred vision (which affected over 23%), and itchy throats (which affected over 21%).

Lifestyle-related impacts affected over 52% of the respondents. The main impact of this type was a reduction in outdoor recreational activities (involving over 41% of the respondents). Over 26% of respondents reported that they reduced the amount of times they dined at outdoor eateries during the haze.

How people responded to the haze

People took various measures to mitigate the health impacts of the haze. The most popular measure was wearing an air pollution mask to filter the pollution out of the air. Masks were used by over 50% of the respondents. The price of masks ranged from MYR 0.80 to MYR 5.00 per piece (with an average price of MYR 1.15).

Of the 360 respondents surveyed, more than half sought some type of treatment for ailments caused by the haze. Over 22% of the respondents went to a clinic for treatment for haze-related illnesses. They were given medicines such as cough syrups, eye drops, and skin irritation cream.

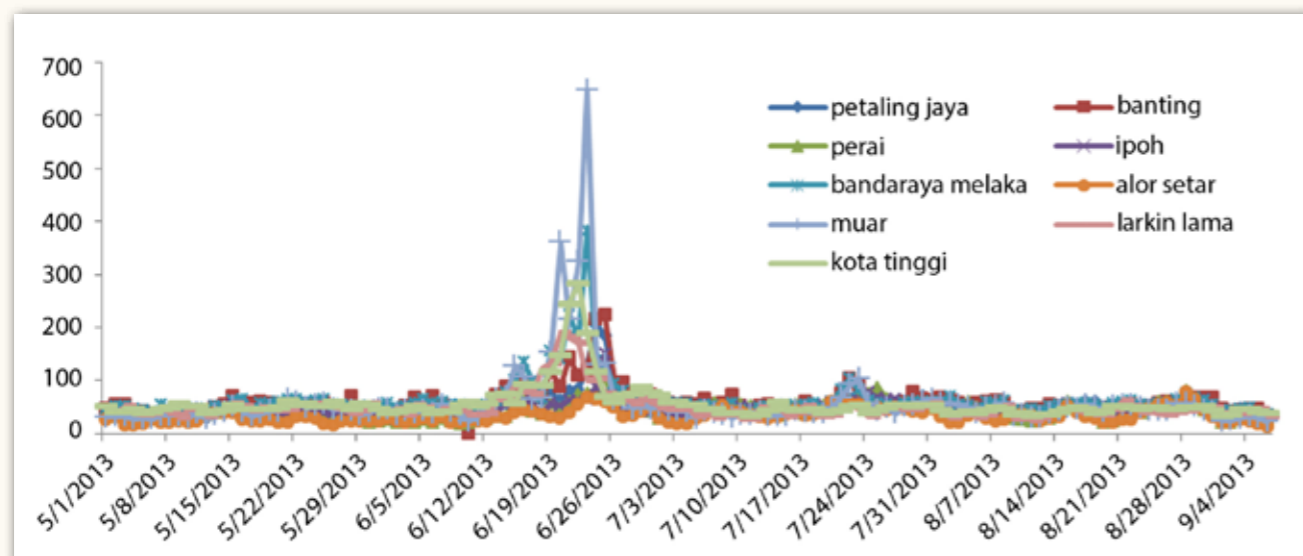


Figure. Trend in API readings during the June 2013 haze

Table 2. Total economic value of the June 2013 haze to Peninsular Malaysia

Form of Loss	MYR per Household	MYR for All Households	Percentage
Cost of illness	78.02	410,587,779.00	27.48
Foregone income opportunities	182.05	958,016,407.00	64.11
WTP to avoid a decline in quality of life	23.90	125,772,818.00	8.42
Total		1,494,377,004.00	100.00

Table 3. Significance of the economic value of the June 2013 haze impacts to the economy of Peninsular Malaysia

Indicator	MYR per Household	MYR for All Households
GDP per household 2012	59,214.46	311,613,794,482.00
Aggregate economic cost of the 2013 haze	283.97	1,494,377,004.00
Proportion of haze impacts to GDP (%)	0.48	0.48

While some respondents visited clinics, many treated themselves by purchasing their own medicines. For example, over 38% of respondents bought cough drops and over-the-counter cough syrups. Another popular response was to rest at home, which was done by over 49% of the respondents.

The study found that some respondents had taken multiple steps to tackle the situation. Depending on their exposure to the haze, respondents would, for example, wear masks and purchase medicines.

The economic costs of the haze

The total economic cost of the haze impacts on Peninsular Malaysia was estimated to be MYR 1,494.4 million.

The haze caused a significant reduction in work output, with 20% of the respondents surveyed reporting that their productivity had been affected. The most significant economic impact of the haze was the impact it had on people's opportunities to earn an

income. This cost each household an average of MYR 182.05. This was calculated to be worth MYR 958 million for the whole of the Malaysian peninsula (i.e., over 64% of the total economic cost of the haze).

The COI due to the haze amounted to MYR 410.6 million (over 27% of the total costs). Medical-related leave taken due to the haze cost MYR 202.8 million (over 49% of the total COI caused by the haze).

A significant cost, but one that people seem willing to bear

Peninsular Malaysia had an estimated GDP of MYR 311.6 billion in 2012. The economic cost of the June 2013 haze was estimated to be MYR 1.49 billion. So, the impact of the haze amounted to 0.48% of Malaysia's GDP. This finding is quite similar to the economic impact of the haze incident in 1997. This was estimated to have cost Malaysia MYR 802 million, which was 0.3% of the nation's GDP at the time.

Despite the high economic cost incurred, people's willingness to pay to avoid a decline in their

quality of life due to haze was quite low. The insurance scheme was supported by only 37.5% of those surveyed. Their average willingness to pay (WTP) was only MYR 23.90 per household. Extrapolated to the whole of Peninsula Malaysia, this WTP would be worth MYR 125.8 million or only 8.42% of the total economic cost of the haze.

This last finding highlights an important observation from the June 2013 haze episode. It was found that Malaysians appear to have become used to haze and tend to continue with their lives as normal, albeit taking the necessary measures (such as buying pollution masks) to deal with its impacts.

WorldFish Philippine Country Office, SEARCA Building, College, Los Baños, Laguna 4031
Tel/Fax: +63 49 501 7493

Email: admin@eepsea.net

For more information about opportunities available at EEPSEA and to download EEPSEA publications for free visit www.eepsea.org