



## HAZE POLLUTION AND SAFETY IMPACT

### Introduction

Haze consists of sufficient smoke, dust, moisture, and vapour suspended in air to impair visibility. Haze pollution can be said to be “transboundary” if its density and extent is so great at source that it remains at measurable levels after crossing into another country’s air space.

Haze is caused by particulate matter from many sources including smoke, and other particles emitted directly into the atmosphere, as well as particulate matter formed when gaseous pollutants react in the atmosphere. These particles often grow in size as humidity increases. Sources hundreds or even thousands of miles away can contribute to visibility problems at remote locations. visibility often is measured as the farthest distance from which a person can see a landscape feature.

Haze originating from large-scale forest and land fires is characterised by a high concentration of particulate matter, which, among other effects, reduces visibility. Due to the specific emission characteristics of forest fires, haze is predominately made of very fine particles with a diameter of less than 10 mm. While coarse particles flush out of the atmosphere within several hours up to a day, fine particles have the longest residence time (up to weeks) in the atmosphere and travel extensive distances (hundreds to thousands of kilometres). Their elimination out of the atmosphere is mainly due to rain.

### Why is the ASEAN region susceptible to haze pollution?

Fires in peat soils have been identified as a major contributor to transboundary haze pollution in the region. 60% of the world’s tropical peatlands are found in Southeast Asia, covering an estimated area of 24 million hectares. Of this, Indonesia has about 70% of the region’s peatlands. Drainage and unsustainable management practices have made peatlands vulnerable to fire. Peat soil, which is comprised of partly decomposed plant material, can easily burn as soon as the water is drained out and the peat dries up. Peat fires are difficult to suppress as they occur under the ground. Peat fires also produce very thick smoke haze and release a high amount of carbon. The land and forest fires in 1997-1998, 2002, and 2005 in Southeast Asia have destroyed more than 3 million hectares of peatlands.



### Haze in Malaysia

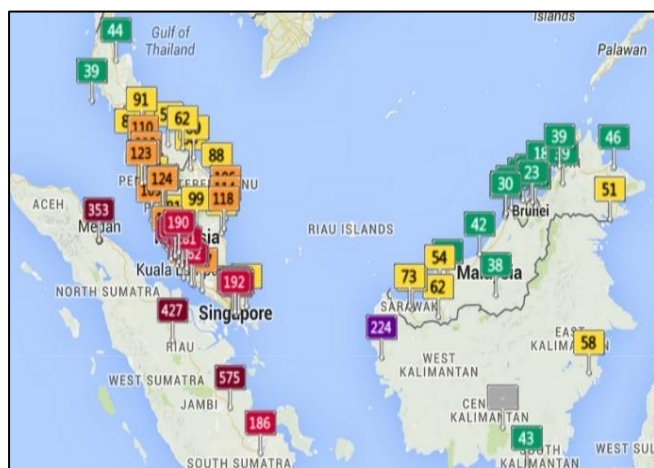
The air in parts of the country was heavily polluted and readings in most of Kuala Lumpur reached the “unhealthy” range (101 to 200) according to the Department of Environment’s Air Pollutant Index (API). Across the entire nation, the highest readings were registered at Rompin, Pahang (194) and Sri Aman, Sarawak (192). According to the API, readings from 201 to 300 are considered “very unhealthy”. Kuala Lumpur, Malaysia’s biggest city with a population of 7.2 million, recorded an API of 157, making visibility a problem. This is also believed to be the highest API reading in the city since the last haze crisis in 2015.

Other areas which recorded “unhealthy” level API readings include Nilai, Negri Sembilan (145); Tangkak, Johor (111); Putrajaya (139); and Selangor (140). Kuching, Sarawak, which suffered from a 241 reading on Monday afternoon, managed to catch a break as it’s API fell to 144 by 11 am on Tuesday. Not all of Sarawak was shrouded in haze though – API readings for places like Limbang and Sarikei were recorded at 53 and 79 respectively. API readings between 0 and 50 are categorized as “good” and “moderate” when between 51 and 100. Readings above 300 are considered “hazardous”. Over in the southern part of the peninsula, Johor’s air quality remained in the moderate range, as did neighboring country Singapore’s.

### Air Pollutant Index (API)

The ambient air quality measurement in Malaysia is described in terms of Air Pollutant Index (API). The API is developed in easily understood ranges of values as a means of reporting the quality of air instead of using the actual concentration of air pollutants. This index also reflects its effect on human health ranging from good to hazardous and can be categorized according to the action criteria as stipulated in the National Haze Action Plan. The Malaysian API system closely follows the Pollutant Standard Index (PSI) developed by the United States Environmental Protection Agency (US-EPA)<sup>1</sup>.

API	Status
0-50	Good
51-100	Moderate
101-200	Unhealthy
201-300	Very Unhealthy
>301	Hazardous



## How does HAZE impact the HEALTH?

Particulate matter less than 10 micrometre's in size, including fine particles less than 2.5 micrometre's, can penetrate deep into the lungs. In recent studies, exposure to particulate pollution – either alone or with other air pollutants – has been linked with premature death, difficult breathing, aggravated asthma, increased hospital admissions and emergency room visits, and increased respiratory symptoms in children. The most common symptoms include irritation and inflammation of the eyes, nose and throat in addition to dizziness, stress and headaches. People can also suffer from reduced lung function that often results in bronchitis.

People who have reduced immunity and already suffer from heart or lung conditions and asthma will experience worsening health. Haze is also very dangerous for pregnant women and their unborn children. People most at risk from exposure to fine particulate matter are children, the elderly, and people with chronic respiratory problems. 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. The long-term impacts on health of exposed children and elderly are unknown.

The effect of haze on light and visibility has an impact on economic production (manufacturing and agricultural), transport, tourism, etc. while haze-caused accidents result in loss of lives. Several gaseous compounds in the haze are likely to affect global environment and climate. Transport was also severely disrupted by haze. Closures of airports and cancellation of flights were common in the region. Economic losses from such disruptions, and aircraft and maritime accidents were compounded by steep declines in tourist arrivals.

## Effects of Low Visibility to Aviation Operations

Instrument Landing System installed at modern airports can help flights landing safely under poor visibility condition. However, in general in the final phase of the approach, pilots need visual reference from the runway to manoeuvre the airplane to touch down. The runway visual range (RVR) is the range over which the pilot of an aircraft on the centre line of a runway can see the runway surface markings or the lights delineating the runway or identifying its centre line.

The minimum RVR requirement for landing depends, amongst others, on the airport facilities, aircraft equipment, pilots' training and airlines' policy. RVR is deduced from the visibility measurement of a transmissometer or a forward scattered along the runway.

The acceptable minima for landing operations under different categories of "Instrument Landing System". If the visibility deteriorates just before the plane touches down, that would pose a great challenge to the pilot. Flights would hold in the air and wait for the visibility to improve. If low visibility condition persists, a flight may have to divert to another airport due to fuel consideration.

After landing, an airplane would move slowly to avoid collision with other aircraft, vehicles or equipment on the apron. As airport operation has slow down, it may cause delays to passengers disembarking and retrieval of luggage.

## How to Protect Yourself from the Haze

### Stay Indoors

Avoid going outdoors as much as possible. It's best to stay indoors when the air outside is not fit for breathing. Only go out if it's an absolute necessity.

### Clean Air Conditioner Filters and User Air Purifier

If you need air conditioners, then make sure that you clean the filters out as often as necessary. Alternatively, you can also use air purifiers. An air purifier will also maintain high quality of air in your home.

### Don't Strain Yourself

Even if you do go out, make sure that you don't do anything strenuous that requires you to inhale deeply. You can commute to work. But, don't go for a jog or extreme outdoors activities.

### Wear a Mask

Invest in a respiratory mask such as the N95 mask, which can filter out airborne particles from the air you are about to inhale. Also, remember that a surgical mask will not be of much help in this situation. So, don't compromise and buy a proper mask.

### Stop Smoking

Quit smoking because there is already too much pollution in the air you are breathing. If you quit smoking, you can avoid any respiratory infection. Plus, smoking is injurious to health anyway.

### Increase Water Intake

Increase your water intake as much as you can. This will help your kidneys flush away the toxins. It will also help you remain hydrated throughout the day.

### Wash Your Hands and Face

Always remember to wash your hands and face as soon as your home. This will minimize any infections. You are bound to bring in particles on your skin and they will add to the pollution levels in your home, resulting in their ingestion.

### Consume Fresh Fruits and Vegetables

Increase your intake of immunity boosting foods such as fresh fruits and vegetables. Not only will these foods improve your immunity, but they will also strengthen your lungs. Make sure that you wash raw foods well before you consume them.

### Visit a Doctor

Don't overlook any symptoms. Visit a doctor as soon as you experience respiratory or other health issues. You'll be surprised at how quickly health issues can escalate if you are constantly exposed to irritants in the air you breathe.

