

**KEMENTERIAN TENAGA, SAINS, TEKNOLOGI, ALAM SEKITAR DAN PERUBAHAN IKLIM**

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LAMPIRAN 1  
NEW SUNDAY TIMES (NEWS): MUKA SURAT 16  
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## CLOUD SEEDING



**AZIAH AZMEE**

**A** CLOUD-seeding operation was conducted in several areas in Selangor, Negri Sembilan and Melaka recently, following severe haze due to fires in neighbouring Indonesia. A Royal Malaysian Air Force Hercules C-130 aircraft took off at the airbase in Subang, carrying a tank filled with 1,200 litres of water and 200kg of salt.

The saline solution was sprayed into the towering cumulus clouds from an altitude of between 1,371m and 2,133m.

The cost of the 2½-hour operation was borne by the National Disaster Management Agency. It involved the RMAF, the Malaysian Meteorological Department and other agencies.

LAMPIRAN 2  
NEWS STRAITS TIMES (NEWS): MUKA SURAT 17  
TARIKH: 6 OKTOBER 2019 (AHAD)



LAMPIRAN 3  
 SUNDAY STAR (NATION): MUKA SURAT 2  
 TARIKH: 6 OKTOBER 2019 (AHAD)

# Investing in a clean environment is good for business



BUDGET 2020 will be tabled on Friday and will contain the usual spending plans for the various ministries and social programmes in the country for next year.

The annual exercise will be scrutinised for how those plans will lay the foundation for Malaysia in the immediate term.

Initial suggestions point to how the government will likely prioritise spending to drive economic growth as that, together with ensuring a trade surplus, are bedrocks in assuring economic and political stability in the country.

The myriad of spending plans, focusing on the underprivileged, will show the compassionate side of the administration but one aspect of how the Budget needs to be moulded is to drive economic growth higher.

There is a saying that the stock market is a barometer of the economy and that is at a four-year low.

The benchmark FBM KLCI has

only been up one year over the past few years and that together with other flashing warning signals have been prevalent in recent times.

With domestic investments flagging, housing in a slump and job creation remaining an issue, measures should be proposed to put more cash in the pockets of Malaysians and to encourage spending.

The risk is the gross domestic products (GDP) growth might still be stuck in the four-percentage point range and for Malaysia, that is not good enough.

The government must lift the lid on the economy and if that means

slowing down the planned decline in the fiscal deficit, then so be it.

The US-China trade war has rolled the global economy and international trade, and the government must capitalise on this rare event.

We cannot afford to remain complacent while neighbouring countries welcome global investments and we adopt a more protectionist stance in dealing with regional or global trade.

Over recent months, Malaysians have also seen how environmental degradation has affected our daily lives.

Everything from the contamination disaster in Pasir Gudang, Johor, to the fires in Riau, Sumatra, that choked much of Malaysia in a cloud of haze and that has been a lingering farce for around two decades, signals that it is time for the government to act in aid of the environment.

Yes, bans and limitations on

single-use plastic is a step in the right direction.

Images of and news on how sea animals have borne the brunt of our environmental disregard have tugged the strings of compassion.

Climate strikes organised by the youth of the world show the anxiety of the generation that will inherit the planet.

For our part, there need to be more legislative and budgetary allocations to ensure that Malaysia starts moving towards environmental best practices.

Budgetary allocations towards the environment need to be done in consultation with the states of Malaysia, as land and most natural resources are matters of the states.

Money should be allocated towards ensuring our rivers are clean, our forests are maintained and the air that we breathe is free from the toxins that have polluted much of the country.

States should be allowed more

development funds only if they offer guarantees that forests that cover about half of Malaysia would not be felled in the name of development and that waters are kept clean.

We can blame the West for doing in the past just what they are asking us not to do now but it is also time for us not to make the mistakes of the developed West and learn from what they are doing to ensure a sustainable Earth and environment for the future of our children.

Furthermore, with the world paying more attention to environmental best practises, doing so is actually good for business.

It is clear how developed countries are using our lax environmental practices against us, and we should acknowledge that spending on keeping the environment clean and sustainable is actually not only good for future business but also that for the future of Malaysia.

LAMPIRAN 4  
SUNDAY STAR (OPINION): MUKA SURAT 3  
TARIKH: 6 OKTOBER 2019 (AHAD)

# Waiting with bated breath for The Haze 2020

Science can be a tricky thing, and science news on the Internet even more so.

WHAT a difference a week or two makes. Just a fortnight ago we were choking on The Haze (really, don't you think such a well-established phenomenon deserves capital letters?), now we are admiring clear blue skies.

The good news is that given that a fortnight "after" is just 20-odd fortnights before the next one, perhaps we should start preparing for The Haze 2020 right now.

Admittedly, just because it happened this year, doesn't mean it'll repeat itself again. In fact, an Indonesian official predicted that the haze the following year will not be as bad, given the country's improved efforts at putting out fires. Only problem, he said this in 2018 about 2019, so who knows what 2020 will bring.

And what did he know, anyway? He was only the chief of Indonesia's Peatland Restoration Agency. Science can be a tricky thing after all, and science news on the Internet even more so.

Take for example the advice to mitigate the haze by draping a wet handkerchief over the fan, as espoused by my so-called friends on WhatsApp. I'm told water droplets will magically capture all the dust and foreign matter. And it apparently works despite the fact that we live in a country where the humidity is a pretty constant 80%.

Never mind, I'll keep my mask on to keep out the bad stuff.

By "bad stuff", I mean those horrible ultrafine particles. Experts are concerned about particles less than 2.5 microns in size. If you breathe them in, they can damage the lungs and cause issues for those with existing issues, such as asthma.

There is also concern that the particles can damage the blood-brain barrier and such damage has been linked with Alzheimer's and Parkinson's disease. It should also be noted that a lower dose of toxins is needed to cause damage if it's the brain of a child.

There is evidence that air pollution affects neurodevelopment in children, affecting mental and motor development.

How do I know this? I read reports from the World Health Organisation and the United Nations Children's Fund about this that I found on the Internet.

So, wear a mask – but which one? The government recently decided to distribute conventional surgical masks in Sarawak, but according to doctors on Twitter (one of whom wrote a piece for an online publication), surgical masks are not good enough. It seems surgical masks are "of little value" and "cannot filter toxic gases and fine particles".

Funny thing is, I read the opposite on the Internet. I mean, yes, the N95 masks do filter more out and work better. But surgical masks do a pretty OK job on their own, it seems.

For example, take this study from the University of Massachusetts which unsurprisingly concluded that "cloth masks are only marginally beneficial in protecting individuals from particles <math><2.5\text{ }\mu\text{m}</math>", but perhaps surprisingly said that the "surgical mask blocked about 60% of .03 micron particles and over 90% of 1 micron and 2.5 micron particles". So it's either 60% efficient or 90% efficient depending on your particle of choice.

Of course, all these numbers are probably exhausting to the layman, we should all just wear the better masks – never mind if they're three to six times more expensive.

(By the way, Facebook says you must wear the masks the green side out. Presumably the dust knows how to avoid you based on the colour.)

In all this, one question seems to have missed the experts: What do the children wear? The N95 mask is too large for small faces, and even the surgical masks don't fit

properly. So what I have seen is parents buy cloth masks nicely decorated with Hello Kitty characters – but we know (courtesy of our friends from Massachusetts) that these aren't very efficient (and probably as good as nothing).

I tell you what is efficient, though: The ability of ultrafine particles to kill children exposed to them. An estimated 600,000 deaths of children under 15 years old can be attributed to ambient and household pollution in 2016. Air pollution accounts for almost 10% of deaths in children under five. And in low/medium income countries in South-East Asia, 99% of children under five are exposed to more air pollution than deemed safe. (It's all in that WHO report I referenced earlier.)

The truth is that while we debate what masks to wear, how to wear them, and even if we should wear them inside out, nobody seems to be discussing the fact that our children are dying. One estimate by a US-led study was that more than 100,000 people would die prematurely as a result of the 2015 haze, with around 6,500 of them Malaysians.

So I'm tempted to ask our authorities, how many premature deaths will there be this

time round? Except that the last time round authorities in the region rejected the findings. Officially, Indonesia said there were only 19 deaths, and Malaysia said there were none, and of the deaths, commented that there was "no such thing!"

The thing about stuff on the Internet is that without being an expert it's quite hard to make valid conclusions, and more information doesn't mean better or correct information. Findings have a lot of caveats, and to a certain degree we must depend on experts to interpret the findings (or to outright say something is false).

Thing is, "no such thing" isn't really a conversation, and if the authorities aren't talking about it, then who will? Who will be that neutral party who curates the facts we need?

Perhaps all will become clearer eventually. In the mean time, all we can do is wait with bated breath for The Haze of 2020 to come upon us.

Logic is the antithesis of emotion but mathematician-turned-scriptwriter Dzof Azmi's theory is that people need both to make sense of life's vagaries and contradictions. Write to Dzof at [lifestyle@thestar.com.my](mailto:lifestyle@thestar.com.my). The views expressed here are entirely the writer's own.

One question seems to have missed the experts: What do the children wear?

LAMPIRAN 5
NST SUNDAY (CONTAMINATION): MUKA SURAT 52
TARIKH: 6 OKTOBER 2019 (AHAD)

CONTAMINATION

Fukushima's radioactive water a big headache

FUKUSHIMA: In the ravaged Dai-ichi nuclear plant here sat a million-tonne headache for the plant's operators and Japan's government: tank after tank of water contaminated with radioactive elements.

What to do with the enormous amount of water, which grows by around 150 tonnes a day, was a thorny question, with controversy surrounding a long-standing proposal to discharge it into the sea, after extensive decontamination.

The water came from several different sources: some was used for cooling the plant, which suffered a meltdown after it was hit by a tsunami triggered by a massive earthquake in March 2011.

Groundwater that seeped into the plant daily, along with rainwater, added to the problem.

A thousand towering tanks have now replaced many of the cherry trees that once dotted the plant's ground. Each can hold 1,200 tonnes, and most of them were full.

"We will build more on the site until the end of 2020, and we think all the tanks will be full by around the summer of 2022," said Junichi Matsumoto, an official with the unit of plant operator Tokyo Electric Power Company (TEPCO) in charge of dismantling the site.

TEPCO had been struggling with the problem for years, taking various measures to limit the amount of groundwater entering the site.

There was an extensive pumping and filtration system, that each day brought up tonnes of newly contaminated water and filtered out as many of the radioactive elements as possible.

"The machinery filters contain radionuclides, so you have to be protected here, just like with the buildings where the reactors are," explained TEPCO risk communicator Katsutoshi Oyama.

TEPCO had been filtering newly contaminated water for years, but much of it needed to go through the process again be-



A researcher showing processed water, where the radioactive element tritium remains, in a lab at the Fukushima Daiichi nuclear plant in Okuma, Fukushima prefecture, Japan, on Wednesday. AFP PIC

cause early versions of the filtration process did not fully remove some dangerous radioactive elements, including strontium 90.

The current process was more effective, removing or reducing around 60 radionuclides to levels accepted by the International Atomic Energy Agency (IAEA) for water being discharged. But there was one that remained, which cannot be removed with the current technology: tritium.

Tritium is naturally present in the environment, and had been discharged in its artificial form into the environment by the nuclear industry around the world.

There was little evidence that it causes harm to humans except in very high concentrations.

IAEA argued that properly fil-

tered Fukushima water could be diluted with seawater and then safely released into the ocean without causing environmental problems.

But those assurances are of little comfort to many in the region, particularly Fukushima's fishing industry which, like local farmers, has suffered from the outside perception that food from the region is unsafe.

Kyoichi Kamiyama, director of the radioactivity research department at the regional government's Fisheries and Marine Science Research Centre, pointed out that local fishermen were still struggling eight years after the disaster.

"Discharging into the ocean? I'm absolutely against it." AFP