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## **Local and Transboundary Haze Study**

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# LOCAL & TRANSBOUNDARY HAZE STUDY

*Inputs by*



**ACADEMY OF SCIENCES MALAYSIA**

*Including additional inputs from*

The Bilateral Roundtable Discussion  
of Indonesian and Malaysian Academicians

For 4<sup>th</sup> APEC CSAE Meeting  
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The first record of haze disrupting daily life in Malaysia goes back to the year 1982. Haze made a recurring return to the country in 1991, 1994, and 1997, with the 1997 episode being one of the worst ever episodes experienced by Malaysia. The 1997 haze was made worse by dry weather prolonged by El Niño, and aggravated by emissions from local sources such as motor vehicles, industries, and open burning of waste. During this time, a 10-day emergency was enforced in Sarawak when the Air Pollutant Index (API) reached above the 500 mark. Following years saw repeated episodes, with varying intensities, with the most recent serious episode being in June to October 2015.

In an effort to identify the root causes of haze that has overwhelmed Malaysia and the rest of the Southeast Asian countries, particularly in the recent years, [Academy](#)

of Sciences Malaysia, through its Haze Task Force (h-TF) and having consulted 119 individual stakeholders:

1. **in Air Quality & Haze Episodes:**

- [1] **aware** that the transboundary impacts of haze on **human health**, the **economy**, **agriculture**, the **environment and biodiversity** have not only affected countries within the region but even beyond, thus challenging international attempts to address these issues;
- [2] **concerned** that despite its perpetuity, transboundary haze is **not a natural event** but, as studies indicated, is made up of **atmospheric pollutants** that are mainly the result of **anthropogenic activities**. Although **El Niño** occurrence, along with prevailing wind directions, does intensify the severity of a haze episode, El Niño cannot be said to be the cause of haze;
- [3] **has discovered** the root cause of transboundary haze lies within the complex **socio-economic**, **ecological**, and **governance** issues that require **multi-pronged approaches** including strong political will and good governance along with the engagement of science diplomacy at both local and regional level;

2. **in Peat Area & Water Management:**

- [4] **have identified peat fires** as one of the sources of the miniscule particles that make up the transboundary haze, and thus, are closely linked to episodes of haze;
- [5] **address** that many tropical peat areas/deposits are generally carbon dated to have been formed more than 6,000 years ago, from local tropical woods & vegetation, preserved within a high water table and/or high water content. The deposit has a very high organic content, in many areas exceeding 90%, and when improperly drained and left dry can catch fire easily, releasing particles into the atmosphere;
- [6] **note** that peat has been used in various countries with different purposes including for fuel peat production in Finland, Ireland and Sweden, and for horticulture industry in Russia, USA and Canada. Canada is currently the world's largest producer and exporter of sphagnum peat moss for horticultural use, producing 98 percent of the peat moss used in the United States.
- [7] **address** that peatlands have a high degree of **socio-economic** importance and bio-diversity but are highly regarded for the purpose of timber extraction and agriculture in Malaysia. There are also the complementary needs to develop settlements and infrastructure in the vicinity and on the

peat substrate, which in its natural form has very low bearing capacity, high water and organic content. While drainage will improve its property, it may result in unequal settlements. Thus, appropriate design and construction methods are required to ensure minimal future destruction to these structures and any unintended drying of the peat substrate.

[8] **recognise** the significance of peatlands for the oil palm industry, which has contributed RM53 billion to Malaysia's Gross National Income in 2011. Additionally in 2014, 88 percent of domestic palm oil production was exported and Malaysia contributed 42 percent of the global palm oil trade;

[9] **highlight** the risk of peat fires and its impact to transboundary haze. The risks of peat fire are due to ineffective in communication and lack of knowledge and understanding of peatlands. This also includes poor land preparation, insufficient agro-environmental peatland management, ineffective policies and socio-economic issues;

[10] **emphasise** the importance of sound [peatland and water management](#) in mitigating the transboundary haze problem, including within areas that have been already opened up for development, abandoned areas and pristine peatlands; particularly the importance of agro-environmental management of peat that includes drainage, compaction and water management;

### 3. in [Waste to Resources: Energy or Materials](#):

[11] **aware** that waste is by nature unwanted, however there is the possibility that the perception of certain waste materials can be changed to something of value instead;

[12] **concerned** that in the case of plantations, there are substantial amounts of [biomass residue](#) (or 'waste') generated at various stages of land clearing, planting, harvesting and replanting processes throughout the life of the plantations, and these residues are often burnt in an attempt to get rid of them quickly, easily and cheaply;

[13] **interested** in the possibility of utilising the biomass residue produced either by land-clearing or on plantations to become higher value [bio-products](#), with monetary returns to the plantations and farmers. If such a strategy could incentivise plantations and farmers not to resort to fire as a primary way to clear the biomass residues, this would then be a positive step towards substantially reducing the severity of haze episodes in the region.

In moving forward, the Academy of Sciences Malaysia concluded that a problem so rooted in socio-economics such as the haze would likewise require solutions rooted

in socio-economics as well. ASM hereby states its position relating to local & transboundary haze as follows:

**FIRST**, recognising that “**slash, not to burn, but to earn additional income**” could be a potential [socio-economic solution](#) to the transboundary haze problem;

[14] **recommend** that concerned Governments should consider investing, through its privately linked companies, in the development of [biomass-to-material](#) or [biomass-to-energy conversion facilities](#) through private-public equity partnerships, and in addition, should also provide a conducive investment environment, including low interest rates, competitive or subsidised pricing or bio-products, as well as through procurement of such products, and well-planned concession areas (large enough to support a sustainable supply of biomass to a designated conversion facility, and close enough to the facility) in order to promote investment in the proposed facilities, either centralised or mobile;

[15] **recommend** that the private sector be further encouraged to take the lead in the proposed investments, with the participation of government investment arms or government linked companies, and with the cooperation of local communities made up of farmers, settlers, smallholders, and adjacent plantation companies;

[16] **suggest** that interested parties should conduct the necessary [techno-economic](#) and environmental feasibility studies prior to investment, namely, the conversion of biomass to ethanol or biomass to electricity, or if not, hydrogen fuel by mobile gasification and hydrogen generation (by electrolysis) units as alternatives to overcoming the [high cost of logistics](#) to centralised facilities;

**SECOND**, knowing that water management is critical in peat areas in the sense that “**manage peat, keep the fire away**”;

[17] **recommend** that those who have received governmental permission to develop peat areas for plantations or any other agro-forestry land development should carry out the following measures to reduce fire risk;

- a) suitable [site selection](#),
- b) maintenance of natural [drainage](#) or sound drain development,
- c) land clearing and [stacking](#),
- d) [compaction](#), and
- e) re-compaction;

[18] **recommend** that those who have already developed plantations in the peat areas should make it a priority to maintain a [high water table](#) by containing

stream flows throughout the plantation irrigation systems, and be aware of (and made responsible for) the forested [areas adjacent](#) to the plantations;

- [19] **recommend** that disturbed, abandoned, or underdeveloped peat areas should be identified and promoted for investments and [rehabilitation](#) by undertaking the above measures in order for such lands to be no longer a fire hazard, and that excess flood waters could be redirected to these areas to encourage rehabilitation and reversion to its natural flow;

**THIRD**, recognising that transboundary haze cannot be effectively controlled at all times and to enable us to “**seeing through the haze**”;

- [20] **recommend** that the enforcement agencies enhance measures to ensure that no open burning is allowed, particularly during the southwest monsoon period from the months of June to early October, and that a local contingency plan should be developed and put into operation during any severe haze episode (emergency of higher than 500 API) in order to reduce [local sources](#) of pollution by the source apportionment method;

- [21] **recommend** that the relevant authorities should incorporate additional forecast products e.g. CPC NOAA El Niño forecasts and the multi-models seasonal climate forecasts of APEC Climate Centre, to further enhance the current forecasting system. These [forecasts](#) and alerts should be more efficiently disseminated to all concerned; and at the same time, every relevant authority and other concerned stakeholders should take [precautionary measures](#), well in advance before any El Niño event sets in;

**FOURTH**, noting that there are still gaps in **Research & Development Areas**;

- [22] **recommend** that [systems studies](#), including socio-economic and legal implications of the proposed local contingency plans to respond in the event of severe haze episodes, be undertaken in order to formulate detailed measures to control local sources of pollution.

- [23] **recommend** that R&D, including radioisotope [tracing and modelling](#) studies, on the high percentage of unidentified sources of pollution be carried out;

- [24] **recommend** that in order to better understand the impact of haze towards health, social life and the economy, studies need to be conducted especially in the areas that most affected by haze episodes. Studies on health should focus on the [toxicological properties](#) of haze particles and

systematically assess the health and social burden of diseases due to haze episodes. Among others, the proposed research areas should cover:

- a. [Epidemiological study](#) on the burden of diseases of air pollutants;
- b. Toxicity assessment of particulates from forest fires; and
- c. Evaluation of the [indoor school environment](#) during haze episodes.

[25] **recommend** for more research and development funding in [biomass utilisation](#) related to the mitigation of the haze problem, as well as the development of databases and support systems for researchers to select the choice of technology or combination of technologies for a more detailed study and to determine with greater accuracy on the required investments and the possible [economic returns](#) to complement the social and environmental benefits of potential solutions to the haze problem;

**FIFTH**, recognising the importance of information dissemination through “**communicating the sciences, for all**”;

[26] **recommend** that the all-important science policy interface is addressed by looking into;

- a. “How can current scientific knowledge be synthesized and translated into policy-relevant information to aid policy and decision-making, management and to suggest further research?”,
- b. at the policy-making level, scientific findings is communicated to support policy development,
- c. a better [communication policy](#) should be realized by better coordination of research conducted by research institutions,
- d. better use of [social media](#) to promote and create public dialogue on critical issues,
- e. [multi-stakeholder activities](#) such as field visits and active public engagement with governmental agencies to positively influence the policy process.

[27] **recommend** that a systematic effort is established to reframe and communicate these issues to the public using common and accessible language in order to:

- a. [sensitise](#) the public to the negative impacts of forest and land burning on the environment, public health and the country’s economy, which is essential to eradicate forest and land burning practices particularly in the high fire-risk areas;
- b. create [social norms](#) among the fire-risk communities, for example through school activities and targeted campaigns (on dangers of setting fires especially during dry weather and the importance of staying vigilant) that will not only help ensure these communities stay safe but can also help reduce the incidence of haze in the long run;

- c. encourage the public to **report fires** and suspicious activities to the relevant authorities; and
- d. deliver information and instructions to the public on ways to **prevent, reduce risk and ameliorate** results of fires through the media best available to the local community, for example through social media and mobile apps, apart from other physical community centres like religious centres and marketplaces.

In addition, consistent with Haze Task Force findings, Academy of Sciences Malaysia also take note of the joint statement of the Bilateral Roundtable Discussion of Indonesian and Malaysian Academicians held in Pekan Baru, Indonesia on 17 and 18 November 2015 that in summary:

- [1] **recognise** that the palm oil sector is an important economic sector for both Indonesia and Malaysia;
- [2] recognise that the palm oil sector is an important economic sector for both Indonesia and Malaysia;
- [3] mindful that haze related to this sector is caused by a minority of companies that maintain unsustainable practises that result in either intentional or unintentional fires;
- [4] **note** that smallholders and swidden farmers do not make up a significant part of the problem;
- [5] **concerned** that there is still a lack of awareness on how the haze affects those closest to the smoke, and how it affects neighbouring countries; and
- [6] **aware** that while the scientific knowledge on peat and its management is well-established, this has not been communicated effectively to the appropriate stakeholders; thus
- [7] **recommend** that economic cooperation between Indonesian and Malaysia, especially in the palm oil sector, needs to be enhanced, especially in terms of foreign investment from Malaysia and monitoring of said investments in Indonesia
- [8] **recommend** also that academic exchange between these countries on this subject is continued and encouraged