

## Forecasting Emissions from Vegetation Fires and their Impacts on Human Health and Security in South East Asia

International workshop organized by the World Meteorological Organisation (WMO) and the International Biomass Burning Initiative (IBBI)  
Supported by the WMO, UNISDR/IWPM, GIZ, IGAC, UNU, the Global Wildland Fire Network and Indonesian Agency for Meteorological, Climatology and Geophysics (BMKG), Jakarta, Indonesia  
29 August – 1 September 2016

### Workshop Announcement

#### Background and Rationale

Since the 1990s South East Asia and neighbouring regions of Asia are increasingly affected by excessive fire application in land use and land-use change and by recurrent human-cause wildfires. In South East Asia traditional slash-and-burn agriculture (swidden land cultivation) during the past millennia provided livelihood for indigenous forest and rural communities, in many cases based on traditional principles of sustainability. However, beginning in the 20<sup>th</sup> Century population growth, migration and economic development resulted in extended conversion of native forests and wetlands (peat biomes) to agricultural lands and plantations. The use of fire as the most economic tool for clearing native vegetation became a driver of change in the region. Biodiversity- and carbon-rich pristine forest and peat-swamp ecosystems were replaced by agro-industrial systems. The periodic recurrence of the El Niño-Southern Oscillation (ENSO) favoured the spread of land-use fires to uncontrolled wildfires, which caused additional, non-intended loss of native ecosystems.



Satellite imagery of smoke from land-clearing fires, spaceborne measurements and ground evidence of atmospheric pollution reveal excessive application of fire in land-use change in the Maritime Continent between 1997 and 2015. Satellite imagery / data: Courtesy NASA

During the El Niño droughts in 1982-83 fires affected more than 5 million hectares of lands in the Indonesian province of East Kalimantan, Borneo. While these events remained largely unnoticed globally the early and late 1990s, particularly during the El Niño of 1997-98, the availability of satellite observation systems allowed the monitoring and damage assessment of large areas burned on insular South East Asia, leaving behind more than 10 million hectares of fire-affected lands in Indonesia alone. Despite the scientific evidence of the negative environmental consequences of large-scale fire application and massive international assistance in building fire management capacities and offering advisory support for the development of environmental and land-use policies the situation remained unchanged. It could also not be influenced by national legislation due to lack of law enforcement. The ASEAN Agreement on Transboundary Haze Pollution, signed in June 2002 and ratified by the last Member State in 2014, so far has not been effective in addressing the underlying causes of excessive and illegal fire application, effective national proactive and coordinated regional emergency response.

With the onset of the next strong El Niño in 2015, the drought-supported acceleration of fire use resulted in the spread of fire on more than 2.6 million hectares. According to the National Disaster Mitigation Agency (BNPB) of Indonesia the damages to the national economy caused by fires in 2015 amounted Rp 221 trillion (US\$16.5 billion), or around 1.9 percent of the country's GDP, more than double what was spent on rebuilding Aceh after the 2004 tsunami.

Apart of the economic damages and the intangible (or difficult to assess) losses of biodiversity and ecosystem services, it has been estimated that the fires burning in September and October 2015 until the onset of the rainy season released about 11.3 Tg CO<sub>2</sub> per day. For comparison: The daily release of CO<sub>2</sub> from fossil fuel burning in the European Union (EU28) is 8.9 Tg.<sup>1</sup> At the eve of the Paris World Climate Conference in December 2015 the magnitude of emissions contributing to anthropogenic climate change alerted international fire scientists, managers and policy makers at the 6<sup>th</sup> International Wildland Fire Conference (Pyeongchang, Korea, October 2015) and called for action:<sup>2</sup>

**International policies and concerted action:** *Collective international efforts are needed to address impacts of vegetation fires that are of transboundary nature and currently affecting at an unacceptable level common global assets such as atmosphere and climate, natural and cultural heritage, and human health and security. Systematic application of principles of Integrated Fire Management (IFM), based on the wealth of traditional expertise and advanced fire science, contributes to sustainable land management, ecosystem stability and productivity, maintenance and increase of terrestrial carbon stocks, and reduction of unnecessary emissions of pollutants that affect human health and contribute to climate change. The COP 21 is encouraged to acknowledge the role and endorse the support of IFM as an accountable contribution to reduce greenhouse gas emissions, maintain or increase terrestrial carbon pools in all vegetation types and ensure ecosystem functioning.*

The human or humanitarian dimension of conversion burnings has been largely unnoticed in the international discussion. This refers particularly to the injuries and premature deaths of smoke-affected populations. This problem had been addressed by the UN and partners in the aftermath of the 1997-98 fire smoke episode in SE Asia by publishing the scientific background of some effects on human health and derived guidelines (WHO Health Guidelines for Vegetation Fire Events, 1999). However, in general limited attention has been paid by policy makers and the public to the consequences of vegetation fire smoke pollution on human health and security. A recent study reveals that more than 180,000 premature deaths per year globally are due to vegetation fire smoke pollution.

### Scope of the International Workshop

The scope of the international workshop "Forecasting Emissions from Vegetation Fires and their Impacts on Human Health and Security in South East Asia" is to

1. Provide an opportunity to share experience between Southeast Asian and international scientists, representatives of national agencies and practitioners on how to understand the underlying reasons, environmental, atmospheric and human health impacts of vegetation fires and smoke pollution.
2. Train responsible agencies in how to forecast vegetation fire smoke emissions, transport, air quality and impact on human health.
3. Explore the interest and feasibility in setting up a Regional Vegetation Fire Smoke Warning Center under the auspices of WMO.

### Organizers: Host and Supporting Organizations

The workshop will be organized by the World Meteorological Organization (WMO) and the International Biomass Burning Initiative (IBBI) in collaboration with the United Nations International Strategy for Disaster Reduction (UNISDR) and the International Wildfire Preparedness Mechanism (IWPM), the United Nations University (UNU), the Global Wildland Fire Network (GWFN) through the Global Fire Monitoring Center (GFMC), Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, the International Global Atmospheric Chemistry (IGAC) Project, and hosted by the Indonesian Agency for Meteorological, Climatology and Geophysics (Badan Meteorologi, Klimatologi, dan Geofisika – BMKG).

### Draft Agenda

<u>Monday, 29 August 2016:</u>	Day 1 – Advanced Seminar on Fire Management for Decision Makers
<u>Tuesday, 30 August 2016:</u>	Day 2 – Training Course (I): Observations
<u>Wednesday, 31 August 2016:</u>	Day 3 – Training Course (II): Modelling Fire Impacts on Air Quality
<u>Thursday, 1 September 2016:</u>	Day 4 – Training Course (III): Drafting the report / recommendations

To register your interest in attending this workshop please email Sheila Kusumaningtyas at BMKG ([sheila.tyas@gmail.com](mailto:sheila.tyas@gmail.com)) and Melita Keywood at CSIRO ([melita.keywood@csiro.au](mailto:melita.keywood@csiro.au)).

<sup>1</sup> Huijnen, V. et al. 2016: Fire carbon emissions over maritime Southeast Asia in 2015 largest since 1997. Nature Scientific Reports 6: 26886. DOI: 10.1038/srep26886.

<sup>2</sup> Outcomes of the Conference: The Pyeongchang Declaration "Fire Management and Sustainable Development" and the annexed Conference Statement - <http://www.fire.uni-freiburg.de/korea-2015.html>