

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) in collaboration with and support of the BMKG, UNISDR/IWPM, GIZ, IGAC, UNU, the Global Wildland Fire Network, the Global Fire Monitoring Center (GFMC) and hosted by Indonesian Agency for Meteorological, Climatology and Geophysics (BMKG)

Hotel Grand Mercure Harmoni, Jakarta, Indonesia, 29 August – 1 September 2016

Agenda

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 20th 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 CO₂ per day. For comparison: The daily release of CO₂ from fossil fuel burning in the European Union (EU28) is 8.9 Tg.¹ At the eve of the UNFCCC COP 21 – the Paris World Climate Conference in December 2015 – the magnitude of emissions contributing to anthropogenic climate change alerted the international community of fire scientists, managers and policy makers at the 6th International Wildland Fire Conference (Pyeongchang, Korea, 12-16 October 2015) and called for action:²

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).

¹ 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.

² 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>

Poster Session

Researchers/lecturers related to atmospheric and climate science studies from WMO members are welcome to register on the poster session. Poster themes range from smoke emissions, pollutant transport, air quality, impact on health, and other related issues. There is no registration fee. Due to the limited display space in the workshop venue, eight best posters will be selected. For details of poster submission and the poster abstract format in Annex I.

Registration and Logistics

Please fill and submit the registration form (Annex II) not later than 20 August 2016, observe the hotel information (Annex III), and find information on transport from the international airport and between meeting venue and hotels in Annex IV and weather information at end of August (Annex V).

Final Draft Agenda

Monday, 29 August 2016: Day 1 – Advanced Seminar on Fire Management for Decision Makers

07:45-08:15 **Registration of participants**

08:20-09:45 **Opening of the Workshop**

Announcer: Master of Ceremony

- Welcome remarks by the Director General of BMKG (Dr. Andi Eka Sakya)
- Welcome remarks by WMO (Prof. Dr. Alexander Baklanov)
- Opening speech and Inauguration of Indonesia GAW by Ministry of Environment and Forestry (Dr. Siti Nurbaya Bakar)

09:45-10:00 **Coffee break**

10:00-11:15 **Session I: Occurrence and impacts of vegetation fires in the region**

Moderator: Dr. Melita Keywood (C.S.I.R.O., Australia)

- State of wildfire and land-use fire application in the Maritime Continent (Prof. Dr. Bambang Hero Saharjo, Bogor Agricultural University, Indonesia)
- Impact of vegetation fire emissions on human health (Drg. M. Kamaruzzaman, M.Sc, Ministry of Health, Indonesia)
- Impact of vegetation fire emissions on human health and security: 20 years of observations in Southeast Asia and neighbouring regions of Asia (Central, Northeast and Western Asia – Mongolia, Russia and Ukraine) and results of global modelling (Prof. Dr. Johann G. Goldammer, GFMC)
- Impact of vegetation fire emissions on the regional and global atmosphere: Contribution to climate change (Dr. Johannes Kaiser, MPICh)
- Impact of fire application and fire-induced ecosystem degradation and destruction on biodiversity and ecosystem services (Budi S. Wardhana, BRG)

11:20-13:00 **Session II: Fire management and environmental governance**

Moderator: Prof. Dr. Bambang Hero Saharjo, Bogor Agricultural University, Indonesia

- Reduction of unnecessary use of fire and prevention & control of wildfires: Lessons identified during the last 20 years and implications for the future of Integrated Fire Management (IFM) measures in Indonesia (Georg Buchholz, GIZ)
- Environmental governance: Land-use and fire management policies, legislation and law enforcement in Indonesia (Raffles B. Panjaitan, Ministry of Environment and Forestry, Indonesia)
- The ASEAN Agreement on Transboundary Haze Pollution: Review and prospects of implementation (Saroj Srisai, ASEAN Secretariat, Jakarta)
- International concerted action: Considerations, initiatives and status of building an "International Fire Regime" (Prof. Dr. Johann G. Goldammer, GFMC)

- 13:00-14:00 Lunch break**
- 14:00-14:45 Session III: State of the science and technologies in early warning, forecasting, monitoring and impact assessment**
Moderator: Prof. Dr. Alexander Baklanov
- Utility and use of satellite sensors in depicting and quantifying vegetation fire occurrence, impacts on the ground and emissions (global to regional) (Prof. Dr. Martin Wooster, King's College, London)
 - Fire early warning: Status of development and use of Fire Danger Rating Systems (national, regional and global) (Dr. Bill de Groot, Canadian Forest Service)
 - The Indonesian Fire Information System (Agus Haryanta, Ministry of Forestry, Indonesia)
- 14:50-16:00 Session IV: Towards building regional vegetation fire smoke pollution forecast center – Experiences and needs**
Moderator: Dr. Johannes Kaiser, Max Planck Institute for Chemistry, Germany
- Regional Fire Management Resource Centers – Achievements and visions (Prof. Dr. Johann G. Goldammer, GFMC)
 - Possible role and functioning of regional vegetation fire smoke pollution warning centers (Dr. Dodo Gunawan, BMKG Indonesia)
 - ASEAN Specialised Meteorological Centre (Dr. Christopher Gan, Singapore Meteorological Service)
 - Relationships to and potential contributions of WMO programmes (GAW App SAG, WWRP S2S and HIW, Agriculture Meteorology, DPFS) (Prof. Dr. Alexander Baklanov, WMO)
- 16:00-16:30 Coffee break**
- 16:30-17:30 Discussion**
Moderator: Moderator: Prof. Dr. Johann G. Goldammer, Global Fire Monitoring Center (GFMC), Max Planck Institute for Chemistry, Germany
- General thematic recommendations: Initial thoughts for the final Workshop Day (Prof. Dr. Johann G. Goldammer, GFMC)
 - Presentation of a concept paper for a potential “Regional Vegetation Fire Smoke Warning Center” (Prof. Dr. Alexander Baklanov and Stéphane Mangeon WMO)
 - Other
 - Closing
- 17:30-18:30 Break**
- 18:30-21:00 Welcome Dinner**

Tuesday, 30 August 2016: Day 2 – Training Course (I): Observations

Training program by Dr. Melita Keywood (Australia), Puji Lestari (Indonesia), Fabienne Reisen (Australia) and Iqbal Mead (UK)

09:00-09:20 Opening

- Opening speech by Deputy of Climatology
- Introduction (Dr. Melita Keywood)

09:05-11:15 GAW measurements and observations of fire

Moderator: Melita Keywood

- GAW stations in Indonesia (Dr. Dodo Gunawan, BMKG Indonesia)
- Other GAW stations in the region (Nurizana Binti Amir Aziz)
- The chemistry of smoke (Dr. Fabienne Reisen)
- Peat fires: Field measurement and lab-scale observations (Dr. Puji Lestari)
- Close-to-source fire emissions measurements in Indonesia (Prof. Dr. Martin Wooster)

11:15-11:30 Coffee break

11:30-13:00 Case Study Investigation: 2015 Southeast Asian haze event

Moderator: Dr. Puji Lestari

- Part 1 Background, tools, data required

13:00-14:00 Lunch break

14:00-15:30 Case Study Investigation: 2015 Southeast Asian haze event

Moderator: Dr. Melita Keywood

- Part 2 QA/QC, analysing and presenting data

15:30-16:00 Coffee break

16:00-16:30 Summing up and next steps

Moderator: Dr. Melita Keywood

Wednesday, 31 August 2016: Day 3 – Training Course (II): Modelling Fire Impacts on Air Quality and Health

09:00-09:15 Opening

- Introduction by the facilitator

09:15-10:15 Presentations: Fire Danger Forecasts

Moderator: Dr. Dodo Gunawan

- Near term fire danger forecasting with Global Fire Early Warning System (Dr. Bill de Groot)
- Medium-range fire danger forecasting at ECMWF (Dr. Mark Parrington)
- Seasonal and historical fire danger (Dr. Robert Field)

10:15-11:15 Presentations: Fire Observations & Emissions

Moderator: Dr. Christopher Gan

- Satellite Fire Observations (Prof. Dr. Martin Wooster)
- GFAS Emissions (Dr. Mark Parrington / Dr. Johannes Kaiser)
- IS4FIRES Emissions (Dr. Mikhail Sofiev)

11:15-11:45 Coffee break

11:45-12:45 Presentations: Smoke Forecasts

Moderator: Prof. Dr. Martin Wooster

- Copernicus Atmosphere Monitoring System (Dr. Mark Parrington)
- MASINGAR at MRI-JMA (Dr. Taichu Tanaka)
- Regional Specialized Meteorological Centre (RSMC) (Dr. Anton Muscat)
- Dr. Christopher Gan / Dr. Felicia Shaw (ASEAN Specialised Meteorological Centre, Singapore Meteorological Service)

13:05-14:00 Lunch break

14:00-16:00 Practicals

Moderator: Dr. Johannes Kaiser

- Participants use the introduced systems to copy plots from the web, download and plot data, or download and use data in their own applications (in groups of 2-3)
- Presenters of the morning are around to assist.

16:00-16:15 Coffee break

16:15-16:45 2-minute presentations by participants

Moderator: Prof. Dr. Martin Wooster

Thursday, 1 September 2016: Day 4 – Training Course (III): Drafting Report / Recommendations

09:00-09:30 Introduction

Moderator: Dr. Bill de Groot

- Topics to be addressed
- Formation of breakout groups

09:30-11:00 Breakout Group Sessions

- Breakout Group I: t.b.d.
- Breakout Group II: t.b.d.
- Breakout Group III: t.b.d.
- Breakout Group IV: t.b.d.

11:00-11:30 Coffee break

11:30-12:30 Reporting back of Breakout Groups

Moderator: Dr. Melita Keywood

12:30-13:30 Final discussion and workshop recommendations

Moderator: Prof. Dr. Alexander Baklanov, WMO

13:30 Adjourn

Departure of international participants

Annex I

Details for Poster Format and Abstract Submission

Poster abstracts and printed posters can be submitted to the following emails: wsbiomass@bmkgo.id. The abstract should not exceed one A4 page and must contain (1) at least two authors in the author block, (2) a hypothesis or statement about the problem under investigation, (3) a statement of the experimental methods/methodology used, (4) essential results provided in summary form, and (5) a conclusion. For printed posters, the standard size is 54 cm x 110 cm and must be submitted in adobe illustrator and PDF formats.

Poster abstracts must be submitted before 15 August 2016. Notification of acceptance will be given by 22 August 2016. Full posters must be submitted by 27 August 2016. Only one abstract can be submitted per applicant.

Abstract Template

Title of Poster

First AUTHOR¹, Second AUTHOR¹, Third AUTHOR¹, and Fourth AUTHOR²

¹*Affiliation, City, Country*

²*Affiliation, City, Country*

This is a template file for submitting abstract to *The International Workshop on Forecasting Emissions from Vegetation Fires and their Impacts on Human Health and Security in South East Asia*. All abstracts should be completed using this template and must be submitted after being converted to PDF files. Submissions in other formats will not be accepted. The abstract must fit within one page of standard A4 size. Do not change fonts, font size, line spacing and so on for the sake of consistency throughout the abstract volume. The abstract file should be named as the name of corresponding author in capital letters followed by underscore and title of presentation (i.e. AUTHOR_Biomass Burning.pdf).

Key words: (up to 5)

References (if needed)

Author, A., and B. Author, 2015: *Journal*, **70**, 12-34.

Author, C., and Co-authors, 2011: *Journal*, **66**, 78-90.

Annex II – Registration Form



International Workshop
Forecasting Emissions from Vegetation Fires
and their Impacts on Human Health and Security in South East Asia
 Hotel Grand Mercure Harmoni, Jakarta, Indonesia, 29 August 2016

REGISTRATION FORM

First (given) name	
Last name (surname)	
Profession	
Affiliation/Organization	
Address	
Country	
Telephone	Home office: During travel in Jakarta (cell phone):
Email	
Request for hotel reservation Note: If you do not wish to stay in Hotel Grand Mercure Harmoni, please do not fill the right box	Please make a room reservation for me in Grand Mercure Harmoni: Type of room: Date of arrival: Date of departure:
Arrival and departure details (Soekarno Hatta Airport)	Date and time of arrival: Flight number: Transport by Org. Committee requested (yes/no): Date and time of departure: Flight number: Transport by Org. Committee requested (yes/no):

Please send this registration form to: wsbiomass@bmgk.go.id

Or by fax to: +62-21-65866236

Deadline for attendance confirmation: 20 August 2016.

Annex III – Hotel Information

The workshop will take place in Hotel Grand Mercure Harmoni, Jakarta
<http://www.grandmercure.com/GRAND-MERCURE-JAKARTA-HARMONI>

The Secretariat will book rooms in the hotel according to your request on the registration form. The available rooms and rates including breakfast, lunch, and dinner per day are as follows:

- Special Offer for Workshop participants: Single occupancy room: 112 USD per day (including breakfast, lunch, dinner, and 2 coffee breaks per day)

Furthermore the hotel offers the following rooms. The rates include also breakfast, lunch and dinner:

- Superior Room: 142 USD
- Deluxe Room: 157 USD
- Business Suite: 216 USD
- Executive Suite: 264 USD

Participants who want to take advantages on the package must book and pay it and all incidentals (e.g. laundry service, telephone calls to outside) through the Secretariat. Check-in time: 14:00 hrs, check-out time: 12:00 hrs. Please kindly note that smoking is not allowed inside the hotel. The hotel offers free internet connection at about 2.5 Mbps throughout the hotel and upgradable up to 128 Mbps during the training.

Other hotels around the venue (Grand Mercure Harmoni) are:

If you prefer to stay in one of the following hotels nearby the venue, please indicate this on the registration form

Redtop Hotel Pecenongan: <http://www.redtophotel.com/>

Alila Hotel Jakarta: <http://www.alilahotels.com/jakarta>

Grand Mercure Kemayoran Jakarta: <http://www.mercure.com/gb/hotel-9896-grand-mercure-jakarta-kemayoran-/index.shtml>

Swiss-Bell Hotel Kemayoran: <http://www.swiss-belhotel.com/id-id/swiss-belinn-kemayoran>

Best Western Kemayoran: <http://bwpluskemayoran.com/>

Please check the links for rate and do your own reservation. If you need assistance for hotel booking, please indicate this in your registration form. Please note that the secretariat will not provide travel support from the selected hotels to the venue.

Annex IV – Information on Travel in Jakarta

Please note that the local organizing committee will provide travel support from the Soekarno Hatta Airport to the hotel where the workshop takes place regularly on particular times. The committee will also provide the travel support from the hotel to the airport. Therefore, foreign applicants should provide details of flight arrivals and departures in the registration form.

Also, the committee will provide travel support from the hotel to the workshop venue in BMKG.

In case there are applicants who miss the travel support, they may go to the hotel by taxi directly. One of recommended taxi is the Blue Bird Group, and others associated to the Group can be found in the following link: <http://www.bluebirdgroup.com/>.

Annex V – Weather Information

The weather in Jakarta by end of August/early September is expected to be mostly cloudy and cloudy with a shower. Climatologically it is the dry season. Temperatures in August in Jakarta are usually around 25-33°C, and RH around 50-80%.