LAND-FOREST FIRE MANAGEMENT AND CLIMATE CHANGE IN INDONESIA

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Ministry of Environment and Forestry

Forum of National Bioethics Committees (NBCs) on Transboundary Haze Pollution
Addressing Environmental, Social and Ethical Challenges of the Annual Haze in South East Asia: Bioethics and Sustainability Science in Action

Jakarta, 6-7 December 2017
31st Session

the General Conference invited the Director-General to submit “the technical and legal studies undertaken regarding the possibility of elaborating universal norms on bioethics”

IBC Report

Report of the IBC on the Possibility of Elaborating a Universal Instrument on Bioethics

Adopted

Adopted by UNESCO’s General Conference
Some 195 states joined a UNESCO Declaration of Ethical Principles in relation to Climate Change on 13 November 2017, when meeting in Paris at the 39th session of UNESCO’s General Conference.
Climate change is already impacting public health, food and water security, migration, peace and security.

Investments in sustainable development will help address climate change by reducing greenhouse gas emissions and building climate resilience.

Action on climate change will drive sustainable development.

Tackling climate change and fostering sustainable development are two mutually reinforcing sides of the same coin; sustainable development cannot be achieved without climate action. Conversely, many of the SDGs are addressing the core drivers of climate change.
Climate change

1 January 2016, the 17 Sustainable Development Goals (SDGs) of the 2030 Agenda for Sustainable Development — adopted by world leaders in September 2015 at an historic UN
PARIS AGREEMENT: to strengthen the global response to the threat of climate change, in the context of sustainable development and efforts to eradicate poverty, including by:

- Below 2°C - 1.5°C
- Equity and CBDR-RC/Common but Differentiated Responsibilities and Respective Capabilities.
Goal of Paris Agreement and its Implementation in Global and National Context

Facilitative Dialogue
- Global Stock Take
- Facilitation and Compliance

Transparency Framework
- NatCom
- BUR
- FREL-MRV

Mitigation – Adaptation and avert Lost and Damage
MOI (Finance, Technology, Capacity Building)

TMS GHGs Inv – MRV – NRS

Nationally Determined Contribution (NDC)

POLICY AND MEASURES:
- Policy & regulations
- Institutional setting
NDC Indonesia: Projected BAU and emission reduction from each sector category

<table>
<thead>
<tr>
<th>No</th>
<th>Sector</th>
<th>GHG Emission Level 2010* (MTon CO₂e)</th>
<th>GHG Emission Level 2030 (MTon CO₂e)</th>
<th>GHG Emission Reduction</th>
<th>Annual Average Growth BAU (2010-2030)</th>
<th>Average Growth 2000-2012*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>BaU</td>
<td>CM1</td>
<td>CM2</td>
<td>CM1</td>
<td>CM2</td>
</tr>
<tr>
<td>1</td>
<td>Energy*</td>
<td>453.2</td>
<td>1,669</td>
<td>1,355</td>
<td>1,271</td>
<td>314</td>
</tr>
<tr>
<td>2</td>
<td>Waste</td>
<td>88</td>
<td>296</td>
<td>285</td>
<td>270</td>
<td>11</td>
</tr>
<tr>
<td>3</td>
<td>IPPU</td>
<td>36</td>
<td>69.6</td>
<td>66.85</td>
<td>66.35</td>
<td>275</td>
</tr>
<tr>
<td>4</td>
<td>Agriculture</td>
<td>110.5</td>
<td>119.66</td>
<td>110.39</td>
<td>115.86</td>
<td>9</td>
</tr>
<tr>
<td>5</td>
<td>Forestry**</td>
<td>647</td>
<td>714</td>
<td>217</td>
<td>64</td>
<td>497</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td>1,334</td>
<td>2,869</td>
<td>2,034</td>
<td>1,787</td>
<td>834</td>
</tr>
</tbody>
</table>

* Including fugitive
** Including peat fire

Notes: CM1 = Counter Measure 1 (unconditional mitigation scenario)
CM2 = Counter Measure 2 (conditional mitigation scenario)

Target: 29-41% BAU in 2030
National GHG emissions were estimated to be 1.8 GtCO2e in 2005. This represents an increase of 0.4 GtCO2e compared to 2000. Most emissions (63%) are the result of land use change and peat and forest fires, with combustion of fossil fuels contributing approximately 19% of total emissions. Based on Indonesia’s First Biennial Update Report (BUR) submitted to UNFCCC in January 2016, national GHG emissions was 1.453 GtCO2e in 2012 which represent an increase of 0.452 GtCO2e from year 2000. The main contributing sectors were LUCF including peat fires (47.8%) and energy (34.9%).
FHS IN INDONESIA (2015-2017)

Source: NASA MODIS, 2017
Source: NASA MODIS, 2017
BURNED AREA : INDONESIA

Year

Burned Area (ha)

2010: 3,500.12
2011: 2,612.09
2012: 9,606.53
2013: 4,918.74
2014: 12,110.54
Burned Area Estimation
Source: MODIS Terra 250 m and 500 m
Method: difference Normalized Burn Ratio (dNBR)

- Capacity building
- Science
- Knowledge
- Skill
INFO KARHUTLA 2017

PERBANDINGAN JUMLAH HOTSPOT

2015
NOAA: 21,929  
TURUN 82.14%
TURUN 94.56%

2016
NOAA: 2,916  
TURUN 40.25%
TURUN 53.17%

2017*
NOAA: 2,359  
TURUN 1,800

Decreasing of hotspot and burned area

Source: MoEF, 2017
Source: NASA MODIS & NOAA, 2017
<table>
<thead>
<tr>
<th>Yr</th>
<th>DJF</th>
<th>JFM</th>
<th>FMA</th>
<th>MAR</th>
<th>APR</th>
<th>MJJ</th>
<th>JJA</th>
<th>JAS</th>
<th>ASO</th>
<th>SON</th>
<th>DAN</th>
<th>NDJ</th>
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<tbody>
<tr>
<td>2015</td>
<td>0.6</td>
<td>0.6</td>
<td>0.6</td>
<td>0.8</td>
<td>1.0</td>
<td>1.2</td>
<td>1.5</td>
<td>1.8</td>
<td>2.1</td>
<td>2.4</td>
<td>2.5</td>
<td>2.6</td>
</tr>
<tr>
<td>2016</td>
<td>2.5</td>
<td>2.2</td>
<td>1.7</td>
<td>1.0</td>
<td>0.5</td>
<td>0.0</td>
<td>-0.3</td>
<td>-0.6</td>
<td>0.7</td>
<td>-0.7</td>
<td>-0.7</td>
<td>-0.6</td>
</tr>
<tr>
<td>2017</td>
<td>-0.1</td>
<td>0.1</td>
<td>0.3</td>
<td>0.4</td>
<td>0.4</td>
<td>0.1</td>
<td>-0.2</td>
<td>-0.4</td>
<td>-0.7</td>
<td>-0.7</td>
<td>-0.7</td>
<td>-0.6</td>
</tr>
</tbody>
</table>

Warm (red) and cold (blue) periods based on a threshold of +/- 0.5°C for the Oceanic Niño Index (ONI) [3 month running mean of ERSST.v5 SST anomalies in the Niño 3.4 region (5°N-5°S, 120°-170°W)]

Next El-Nino Period?

Source: NOAA Center for Weather and Climate Prediction
The variations of the 3-month average sea surface temperature departures from average (the anomaly) in the Niño3.4 region, using the ERSSTv4 data.
Policy and Activities Related to Land and Forest Fire

- President Instruction No. 11/2015 dated 24 October 2015 regarding on the Improvement of Forest and Land Fire Control.
- MoEF Regulation no. 32/2016 on Forest and Land Fire Control.
- MoEF Reg No. P. 15/2017 regarding Guidelines on water surface level measurement in peatland ecosystem management.
- Grand Design on Forest, Plantation and Land Fire 2017-2019 compiled by the Coordinating Ministry for Economic Affairs, Ministry of National Planning and MoEF to improve coordination, synergy and harmonization between central and regional governments and increase the participation of other sectors.
- Indonesia has ratified the ASEAN Agreement on Transboundary Hazard Pollution (AATHP) through Law no. 26 of 2014 on the ratification of AATHP on 14 October 2014.
ASEAN AGREEMENT ON TRANSBOUNDARY HAZE POLLUTION

The Parties to this Agreement,

REAFFIRMING the commitment to the aims and purposes of the Association of Southeast Asian Nations (ASEAN) as set forth in the Bangkok Declaration of 8 August 1967, in particular to promote regional co-operation in Southeast Asia in the spirit of equality and partnership and thereby contribute towards peace, progress and prosperity in the region.
Forest and Land Fire Risk Zone Map

Fire Danger Rating System

Hotspot Monitoring

Integrated Patrol
Rainfall Forecast on September 2017 – February 2018
Integrated Prevention Patrol

Target: 731 fires prone villages in 6 priority provinces (Riau, Jambi, South Sumatra, West Kalimantan, Central Kalimantan, and East Kalimantan).

Action progress: 110 village command post (≈ 220 villages).
INTEGRATED PATROL
FOREST AND LAND FIRE PREVENTION

Until August 2017 GOI has developed 300 integrated patrol command post in the field that reach 1203 fire prone village
Socialization and Campaign

Aerial Suppression

Canal Blocking

Provincial Task Force
## Canal Blocking in Peatland Area

<table>
<thead>
<tr>
<th>Province</th>
<th>Permit Holder/Company</th>
<th>MoEF</th>
<th>UNDP</th>
<th>Local government</th>
<th>BRG</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Canal Blocking</td>
<td>Reservoir</td>
<td>Canal Blocking</td>
<td>Reservoir</td>
<td>Tube Well</td>
</tr>
<tr>
<td>Riau</td>
<td>8.999</td>
<td>1.432</td>
<td>155</td>
<td>74</td>
<td>90</td>
</tr>
<tr>
<td>Jambi</td>
<td>1.123</td>
<td>126</td>
<td>45</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>S Sum</td>
<td>1.504</td>
<td>187</td>
<td>-</td>
<td>-</td>
<td>20</td>
</tr>
<tr>
<td>W Kal</td>
<td>518</td>
<td>4</td>
<td>-</td>
<td>29</td>
<td>29</td>
</tr>
<tr>
<td>C Kal</td>
<td>-</td>
<td>-</td>
<td>1.125</td>
<td>8</td>
<td>29</td>
</tr>
<tr>
<td>E Kal</td>
<td>-</td>
<td>10</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>S Kal</td>
<td>11</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Number</strong></td>
<td><strong>12.155</strong></td>
<td><strong>1.759</strong></td>
<td><strong>1.280</strong></td>
<td><strong>156</strong></td>
<td><strong>169</strong></td>
</tr>
</tbody>
</table>
# Manggala Agni

1,980 personel

37 Forest Fire Station in 12 fire prone provinces

Fire Care Community (MPA) - 9963 pers, 26 province

## Human Resources

<table>
<thead>
<tr>
<th>Province</th>
<th>Personel</th>
</tr>
</thead>
<tbody>
<tr>
<td>South Sumatera</td>
<td>180</td>
</tr>
<tr>
<td>Riau</td>
<td>210</td>
</tr>
<tr>
<td>Riau Islands</td>
<td>30</td>
</tr>
<tr>
<td>Jambi</td>
<td>285</td>
</tr>
<tr>
<td>South Sumatera</td>
<td>240</td>
</tr>
</tbody>
</table>

## Kalimantan

<table>
<thead>
<tr>
<th>Province</th>
<th>Personel</th>
</tr>
</thead>
<tbody>
<tr>
<td>West Kalimantan</td>
<td>315</td>
</tr>
<tr>
<td>Central Kalimantan</td>
<td>270</td>
</tr>
<tr>
<td>South Kalimantan</td>
<td>180</td>
</tr>
<tr>
<td>East Kalimantan</td>
<td>90</td>
</tr>
</tbody>
</table>

## Sulawesi

<table>
<thead>
<tr>
<th>Province</th>
<th>Personel</th>
</tr>
</thead>
<tbody>
<tr>
<td>North Sulawesi</td>
<td>30</td>
</tr>
<tr>
<td>Southeast Sulawesi</td>
<td>30</td>
</tr>
<tr>
<td>South Sulawesi</td>
<td>120</td>
</tr>
</tbody>
</table>
Haze Condition

January- July: NO

Source: ASMC
In general, during the peak period of hotspot on 21 August 2017, air quality and visibility in Sumatera and Kalimantan reported in a good condition.

<table>
<thead>
<tr>
<th>No.</th>
<th>Indonesia (10 prone Province)</th>
<th>Location</th>
<th>Air Quality (PM10(μg/m³))</th>
<th>Aviation Weather</th>
<th>Temp (°C)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Latest</td>
<td>Highest</td>
<td>Visibility (Km)</td>
</tr>
<tr>
<td>1.</td>
<td>Sumut</td>
<td>Medan</td>
<td>0</td>
<td>0</td>
<td>6,0</td>
</tr>
<tr>
<td>2.</td>
<td>Riau</td>
<td>Pekanbaru</td>
<td>55,23</td>
<td>68,30</td>
<td>2,0</td>
</tr>
<tr>
<td>3.</td>
<td>Jambi</td>
<td>Jambi</td>
<td>0</td>
<td>0</td>
<td>≥10</td>
</tr>
<tr>
<td>4.</td>
<td>Sumsel</td>
<td>Palembang</td>
<td>13,22</td>
<td>56,44</td>
<td>≥10</td>
</tr>
<tr>
<td>5.</td>
<td>Kalbar</td>
<td>Pontianak</td>
<td>0</td>
<td>103,87</td>
<td>≥10</td>
</tr>
<tr>
<td>6.</td>
<td>Kalteng</td>
<td>Palangkaraya</td>
<td>0</td>
<td>0</td>
<td>≥10</td>
</tr>
<tr>
<td>7.</td>
<td>Kalsel</td>
<td>Banjarmasin / Banjarbaru</td>
<td>0</td>
<td>0</td>
<td>≥10</td>
</tr>
<tr>
<td>8.</td>
<td>Kaltim</td>
<td>Samarinda</td>
<td>0</td>
<td>0</td>
<td>≥10</td>
</tr>
<tr>
<td>9.</td>
<td>Kaltara</td>
<td>Tanjung Selor</td>
<td>-</td>
<td>-</td>
<td>6,0</td>
</tr>
<tr>
<td>10.</td>
<td>Papua</td>
<td>Jayapura</td>
<td>-</td>
<td>-</td>
<td>≥10</td>
</tr>
</tbody>
</table>
Satellite Imagery for Haze monitoring produced by BMKG

NO HAZE
READY TO CONDUCT AERIAL OPERATION
(National Disaster Management Authority, MoEF, BPPT, M.o.Transportation, Air Force)

HELICOPTER AND AEROPLANE
Waterbombing and patrol

WATER BOMBING
In 2015: 32 unit
In 2016: 16 unit
In 2017: 26 unit

In 2015: 150.610.150 litre
In 2016: 100.122,90 litre
In 2017: 53.700.500 litre

In 2015: 261,30 ton
In 2016: 128,46 ton
In 2017: 135,2 ton

NaCl for TMC
Data until 31 August 2017
Village based data:
- Vulnerability
- Fire Prone
- Peatland

NEXT: INTEGRATED ACTIVITIES

Activities:
- Climate Village
- Land and Forest Fire
- GHG estimation

731 fires prone villages in 6 priority provinces (Riau, Jambi, South Sumatra, West Kalimantan, Central Kalimantan, and East Kalimantan).
Thank you
@israralbar