PRINCE OF SONGKLA UNIVERSITY
Research and Development Office
Hat Yai, Songkhla 90110, Thailand
Tel. (66-74) 286940 Fax : (66-74) 286961
Website: http://rdo.psu.ac.th

MOE 0521.11/2758

November 11 , 2015

Mr. Kunaifi K. Kunaifi
Dept. of Electrical Engineering
Faculty of Science and Technology
UIN Sultan Syarif Kasim Riau University
JL. H. R. Soebrantas No. 118 Panam
Pekanbaru 28293– INDONESIA

Dear, Mr. Kunaifi K. Kunaifi

Subject : Invitation to the *joint workshops – December 8-9, 2015, Songkhla, Thailand*

On behalf of the organizing committee of the joint workshop, I am pleased to invite you and your colleague to join The 4th Prince of Songkla University - Kanazawa University Joint Workshop (4th PSU-KZU JW), The 3rd Workshop on East Asia Nanoparticle Monitoring Network,"EA-NanoNet-3" and The 3rd Workshop on Environmental Issues related to Agriculture and Agro-industries in South East Asia, "EIAA-3" which will be held at Meeting room 1, 8th floor, Learning Resources Center (Building 1) , Prince of Songkla University , Hatyai, Songkhla, Thailand on December 8-9, 2015.

The attached document provides additional information about the joint workshop. For further inquiries, please contact me with contact details below.

Your sincerely,

Assoc. Prof. Dr. Sutham Niyomwas
Director
Tel. 66-7428-6940
Fax. 66-74286961
E-mail: sutham.n@psu.ac.th


金沢大学
KANAZAWA
PSU มหาวิทยาลัยสงขลานครินทร์
Prince of Songkla University
The 4th Prince of Songkla University – Kanazawa University
Joint Workshop (4th PSU-KZU JW)
The 3rd Workshop on East Asia Nanoparticle Monitoring Network
(EA-NanoNet-3)
The 3rd Workshop on Environmental Issues related to Agriculture
and Agro-industries in South East Asia (EIAA-3)
December 7-9, 2015

Two Decades of Breathing the Haze: an Epic from Riau-Indonesia

Kunaifi[1], Petir Papilo[1] and Widya Astuti[2]

[1]*Faculty of Science and Technology, UIN Suska Riau University, Pekanbaru, Indonesia*

[2]*Hutan Riau, Pekanbaru, Indonesia*

Email: kunaifi@uin-suska.ac.id

Land and forest fire events that cause severe haze 'blanket' over Riau Province of Indonesia and across other south-east Asian countries have been annual catastrophes since the last 18 years. The worst situation was recorded for 2015, in terms of the number of hot spots, the Pollutant Standards Index (PSI), the length and area of the haze cover. More than 115,000 hot spots spread across Sumatra to Papua in October 2015 alone, mostly concentrated in Riau, Jambi, and Central and West Kalimantan Provinces. The fires have burned some 1.7 million hectares of land. After four months breathing the poisoned air, 24/7, in 2015, the haze affected the health of more than 500 thousand people and livelihood of around 75 million people were disrupted. Economic losses were huge, hundreds of flight were delayed or canceled and the fire and haze issue costed Indonesia more than $30 billion since the last 18 years. Schools and universities were closed, relationships with neighbor countries were influenced, and finally states of emergency imposed by the government. All of above, along with the CO_2 emission, can be attributed to the haze. The PSI in Riau Province in September 2015 reached more than 1,000 or three fold larger than the hazardous value, while in Kalimantan it reached above 2,300 (nearly 8 fold of hazardous PSI value). The NASA reported that in 2015 "Indonesia forest fires may become worst on record," that surpassed the 1997 record. The haze come from the fires set to clear forests particularly for palm oil plantations, mostly occurred on the wet peatland in Sumatra and Kalimantan. Although Indonesia has laws in place to protect peatland but they are rarely enforced. The Indonesian Police has handled 256 reports of fire cases that involve nearly 50 thousand hectares burned. Among them, 243 were named as suspects in which 226 are individual suspects and 17 are corporate suspects. However, very few suspects were punished. The future of fire and haze in Indonesia and the region is still uncertain. In 2014, Indonesia supplied about 52 percent of the world's palm oil and palm oil remains a major spur of economic growth in Indonesia. There is no easy solution to this problem. CIFOR claims that legal restrictions on fire are seldom successful while corporate self-regulation has met with mixed success. Further researches are needed to better understanding the complex root causes of fire, since it also deal with poverty and weak governance. Effective mitigation strategy is highly demanded to minimize losses and impacts. The long term solution perhaps will be started from suppression to prevention. The raging land and forest fires in Indonesia that pictures of environment and economy trade-off, could be repeated in the next years and again cause what he Guardian claims as a "crime against humanity.

TWO DECADES OF BREATHING THE HAZE

AN EPIC FROM RIAU

Hat Yai – Thailand

8-9 December 2015

Kunaifi

EnReach

UIN Suska Riau University

Petir Papilo

IPB – Bogor Agricultural Institute

Widya Astuti

HutanRiau

The 4th Prince of Songkla University - Kanazawa University Joint Workshop (4th PSU-KZU JW), the 3rd Workshop on East Asia Nanoparticle Monitoring Network,"EA-NanoNet-3," and the 3rd Workshop on Environmental Issues related to Agriculture and Agro-industries in South East Asia, "EIAA-3.
Hat Yai – Thailand, December 8-9, 2015.

OUTLINE

- Statistics of fires.
- The Impacts.
- The root of the problems.
- Some identified mitigation options.
- Pictures from Riau.
- Discussion

Statistics of Fires

Forest fires and haze disaster 1960 – 2013

http://sains.kompas.com/read/2015/09/14/16272971/Kabut.Asap.Kebakaran.Hutan.Setengah.Abad.Kita.Abai

Statistics of Fires

Province	Oil Palm Prantation Area, 2014	%
RIAU	2,193,720	20.96241
SUMATERA UTARA	1,340,350	12.80791
KALIMANTAN TENGAH	1,099,690	10.50825
SUMATERA SELATAN	1,060,570	10.13443
KALIMANTAN BARAT	914,840	8.741885
KALIMANTAN TIMUR	714,210	6.824736
JAMBI	657,930	6.286945
KALIMANTAN SELATAN	475,740	4.546002
INDONESIA	10,465,020	100

Statistics Indonesia 2015

No.	Province	Pulp Concession Area	
		Unit	Area (Ha)
7	KALTIM	5	793,237
8	RIAU	3	535,492
9	KALBAR	2	412,896
10	SUMSEL	2	340,100
11	SUMUT	1	269,060
12	KALSEL	1	268,585
13	ACEH	2	208,300
14	IRIAN JAYA	1	206,800
15	KALTENG	2	166,880
16	JAMBI	1	78,240
TOTAL		20	3,279,590

Ministry of Forest 2002

Why always Sumatera and Kalimantan on the top?

Oil palm can produce fruit for more than 30 years, providing jobs for millions of people

Statistics of Fires

The climatic conditions in southeast asia are ideally suited for palm oil trees

43 Oil Palm Producing Countries in the world

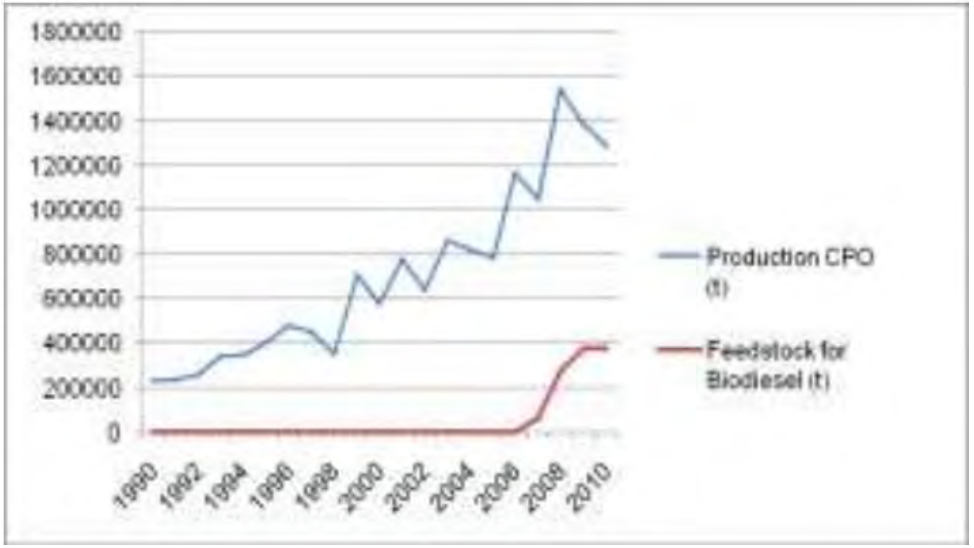
Rank	Country	Production (1000 MT)
1	Indonesia	33,000.00
2	Malaysia	19,800.00
3	Thailand	2,000.00
4	Colombia	1,108.00

Indonesia: 47.6 %, Malaysia: 38.8% & Thailand: 2.9% = 89.3%

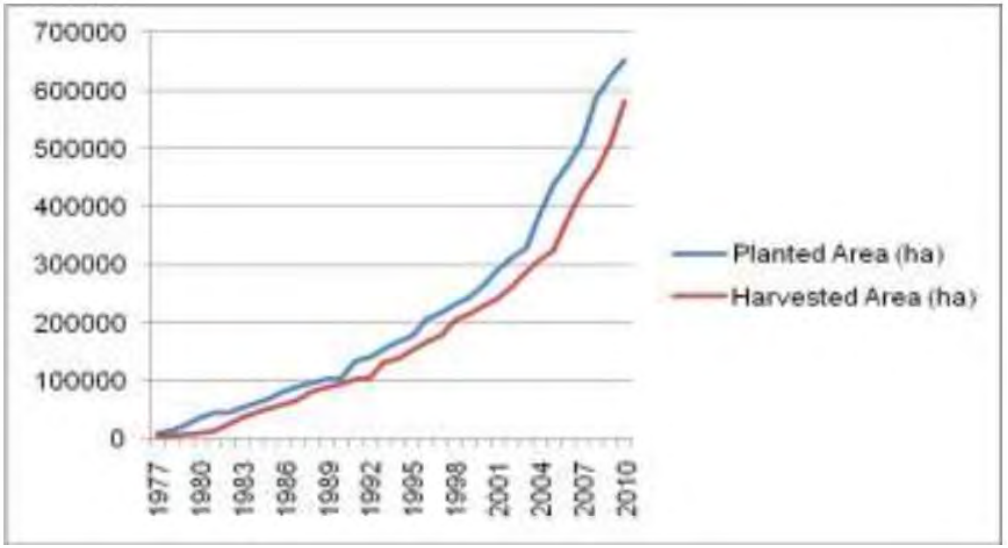
Source: USDOA via Index Mundi

Statistics of Fires

CPO Production in Thailand and Consumption for Biodiesel



Development of planted and harvested area in Thailand



Annual growth: 9 – 11 %

90% of in the Southern Provinces of Thailand.

The Eastern and North Eastern Provinces are prominent areas of expansion

Source: OAE 2010 via Dallinger, J. 2011

Statistics of Fires

Minyak Goreng

Bimoli Bimoli Spesial Happy Delima MAHAKAM Minyak Goreng Pilihan

Margarin & Lemak Nabati

Simas Pilihan Para Ahli PALMIA AMANDA MALINDA Margarine & Shortening Simas Palmia

Indonesia

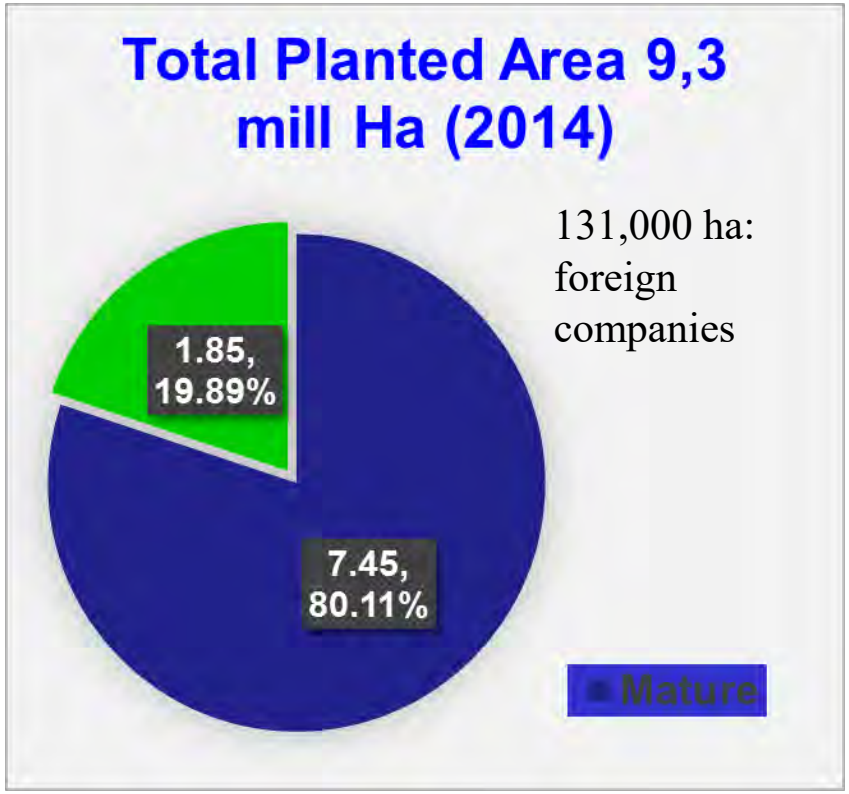
- Oil palm products; cooking oil, in margarines, noodles, baked goods, soaps, detergents and surfactants, cosmetics, pharmaceuticals, bio-fuel, and a wide variety of other household and industrial products.
- Since 2006, demand for palm oil from international buyers increase 27% per year especially in China, India, the Middle East, European Union, and will continue to increase.
- Increasing demand for biodiesel both in Indonesia and abroad.

Malaysia

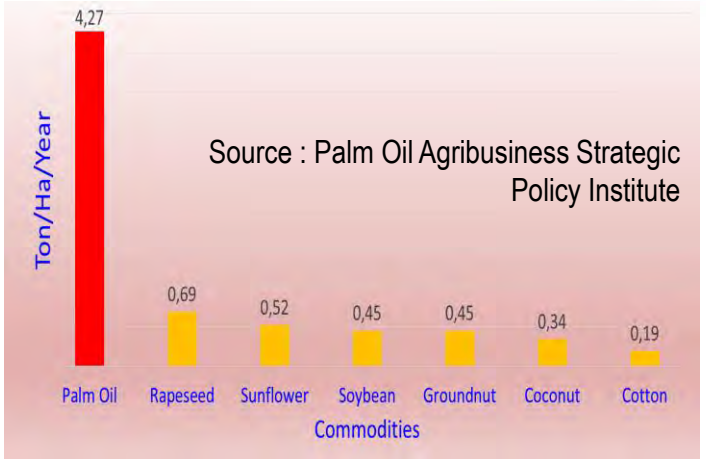
Singapore

Thailand

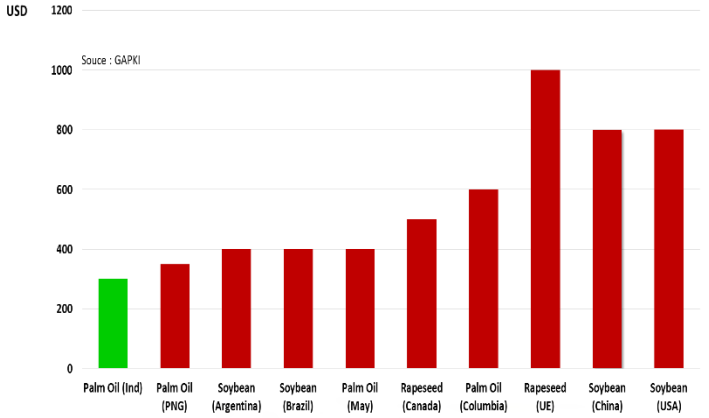
Statistics of Fires



Available area for expansion: 13.6 mill ha



PRODUCTIVITY OF VEGETABLE OILS



PRODUCTION COST OF VEGETABLE OILS

Statistics of Fires

The costs of palm oil:

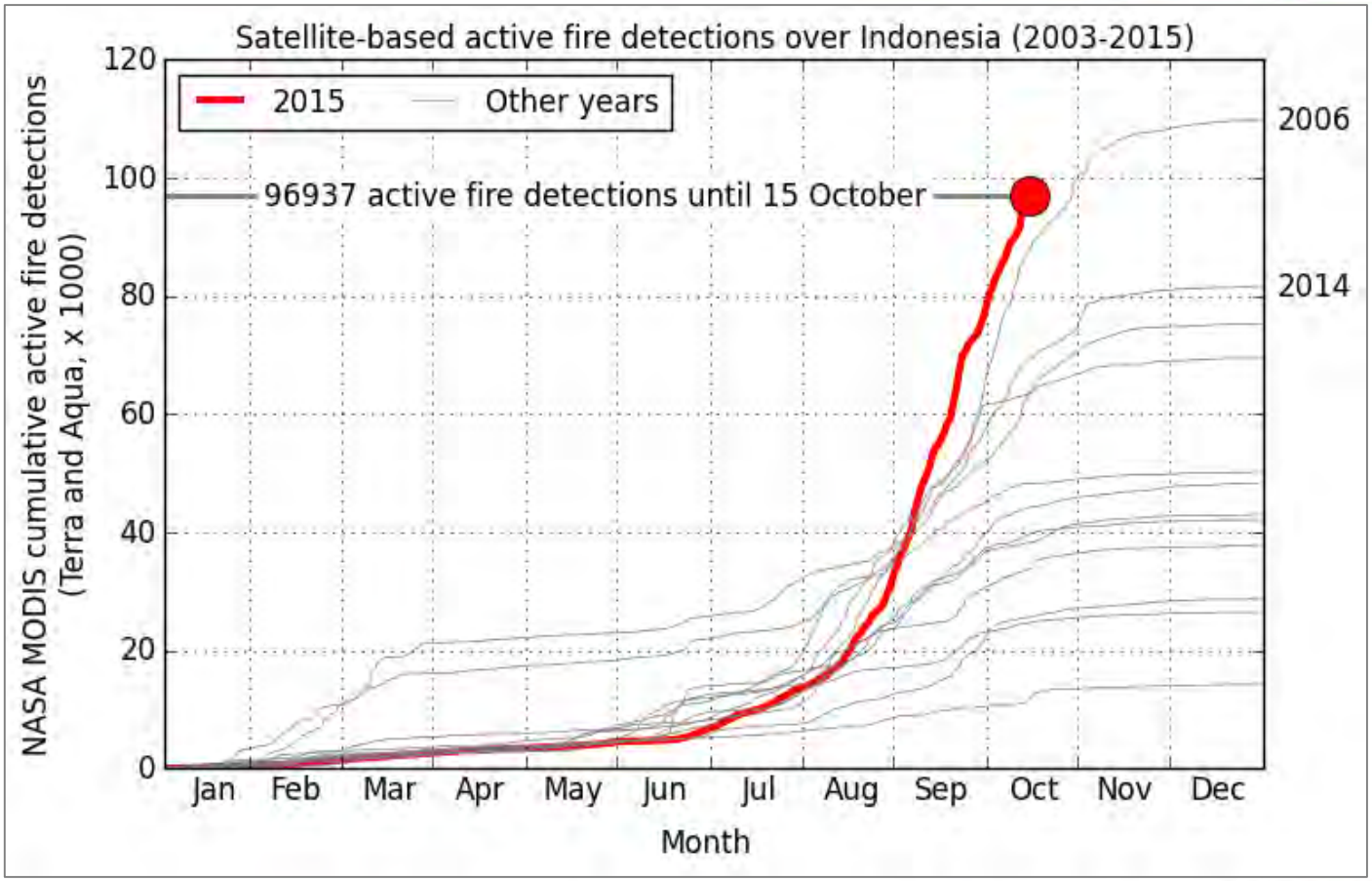
- tropical forest replacements
- killing endangered species
- uprooting local communities, and
- contributing to the release of climate-warming gases.

Statistics of Fires

Paper product near us:


SUGAR
NAN
3
OPEN UP
FOR FUN!
POSEO
15KG

Statistics of Fires



Worst years

1997

2006

2015

El-Nino causes prolonged hot season in 2015

Statistics of Fires

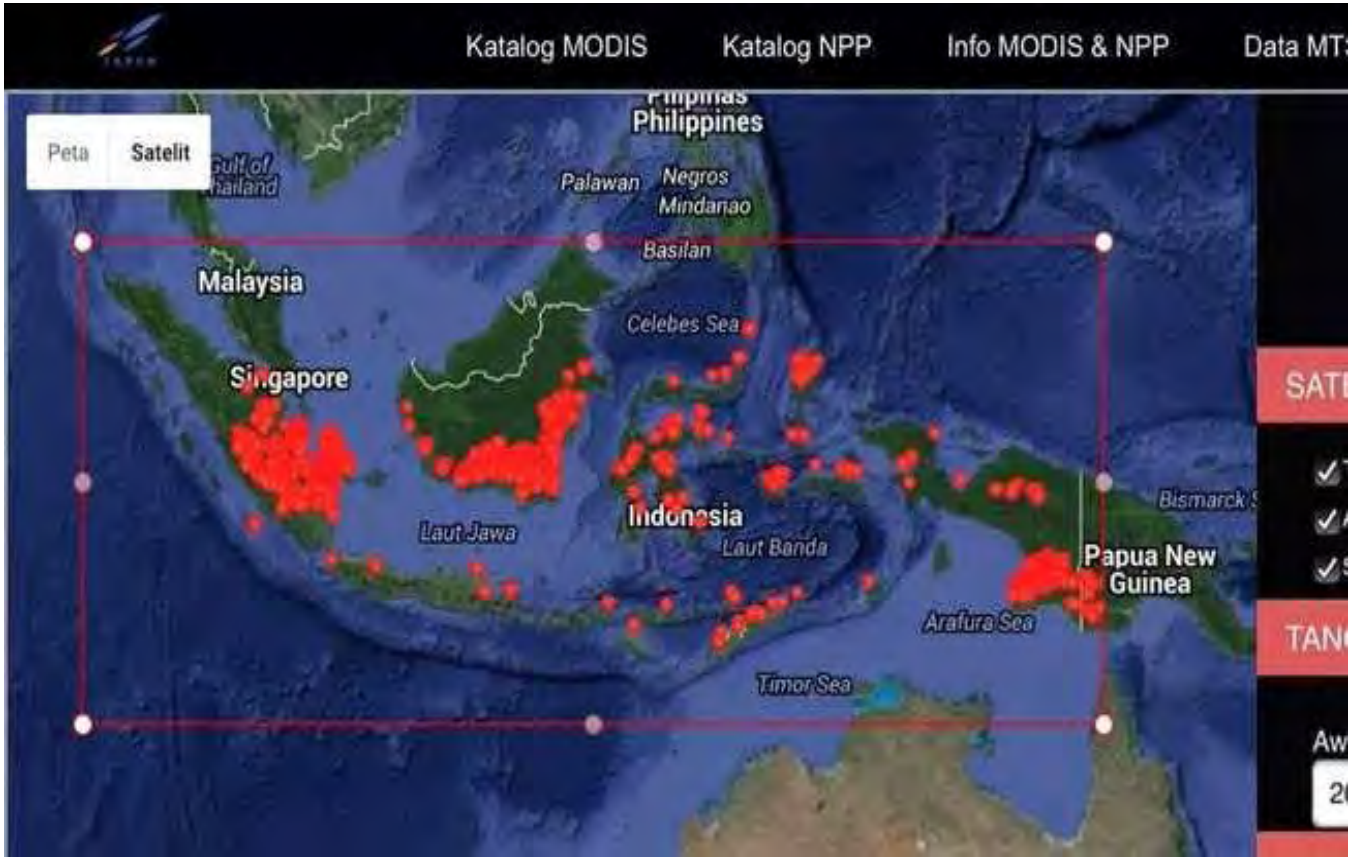


Image: CNN Indonesia (http://www.cnnindonesia.com/nasional/20151021105451-20-86282/kebakaran-hutan-meluas-ke-maluku-papua-titik-api-tembus-3000/)

WE ARE 'progressing'

2015, Indonesia is in fire:

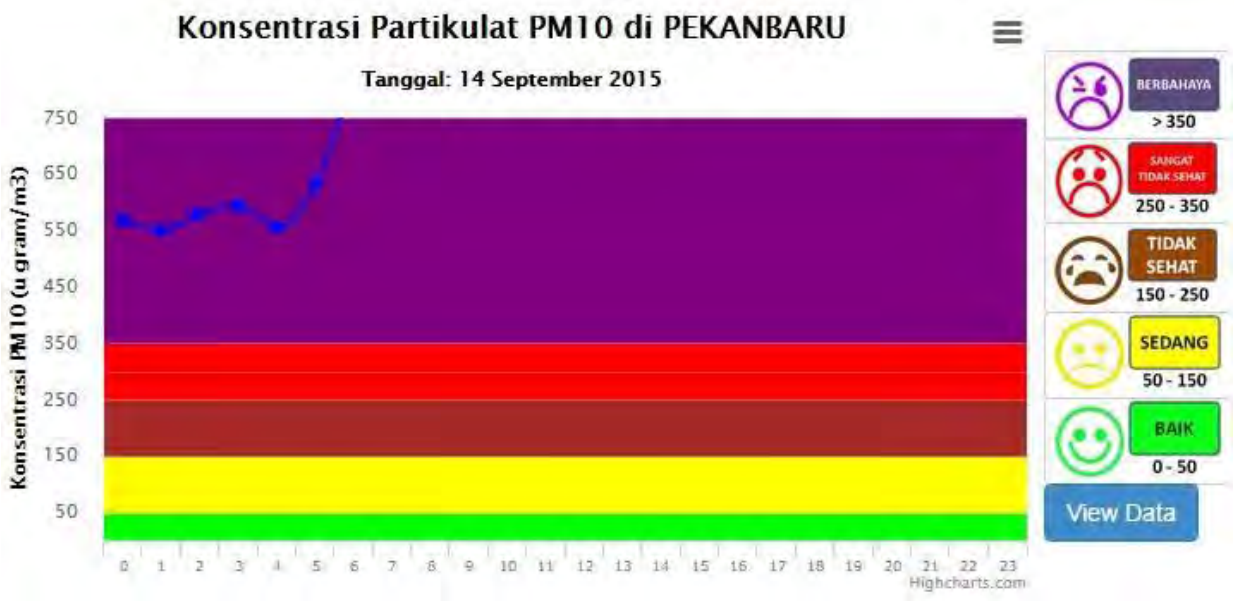
- Existing farmland is dried out and burned for the next season's crop and to clear surrounding forests for expansion,
- Sumatra and Kalimantan are not enough, new stories begun in Sulawesi and Papua.
- +115,000 hotspot in Oct 2015 (Forests News 2015).
- Some 1.7 million hectares have been burned in Sumatra and Kalimantan

Statistics of Fires

Tabel Konsentrasi Partikulat di Pekanbaru, Tanggal : 14 September 2015

PEKANBARU, Jam 0 : 567.86
PEKANBARU, Jam 1 : 549.34
PEKANBARU, Jam 2 : 578.71
PEKANBARU, Jam 3 : 593.51
PEKANBARU, Jam 4 : 555.52
PEKANBARU, Jam 5 : 631.56
PEKANBARU, Jam 6 : 805.94
PEKANBARU, Jam 7 : 900.29
PEKANBARU, Jam 8 : 972.60
PEKANBARU, Jam 9 : 1065.26
PEKANBARU, Jam 10 : 1074.76

150 – 250: unhealthy
250 – 300: very unhealthy
300 >: hazardous

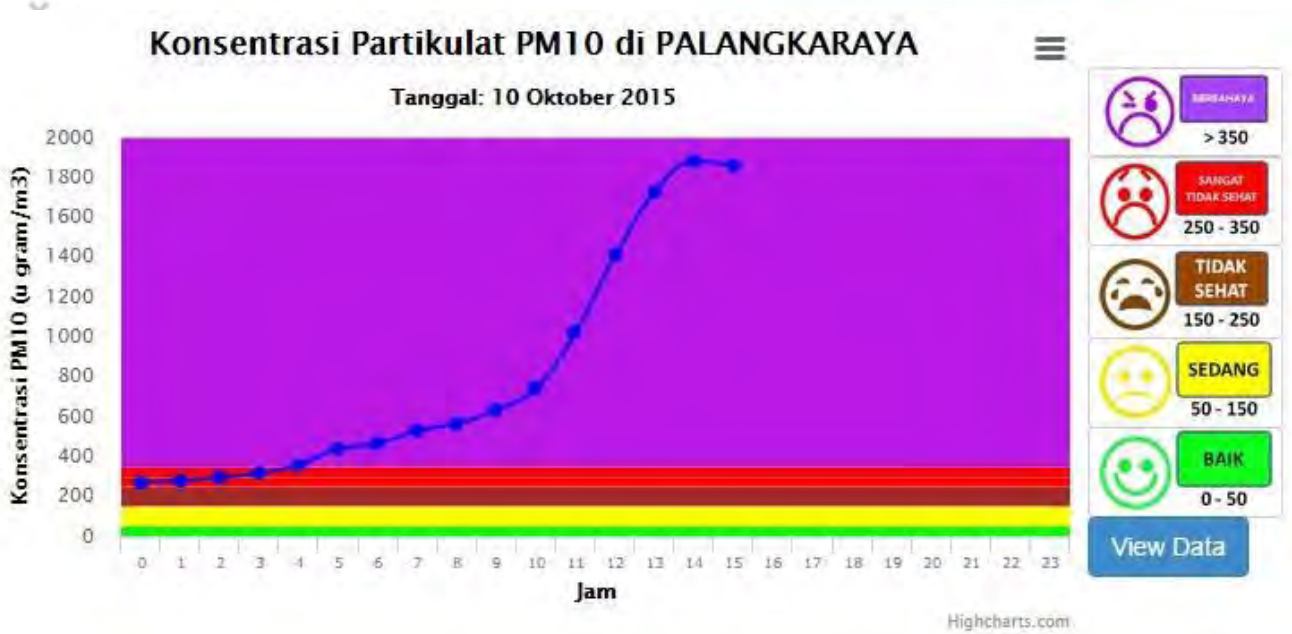


Indonesian Bureau of Meteorology does not have monitoring instruments for smaller PMs in locations with high risk of land and forest fires.

Statistics of Fires

Tabel Konsentrasi Partikulat di Palangkaraya, Tanggal : 22 September 2015

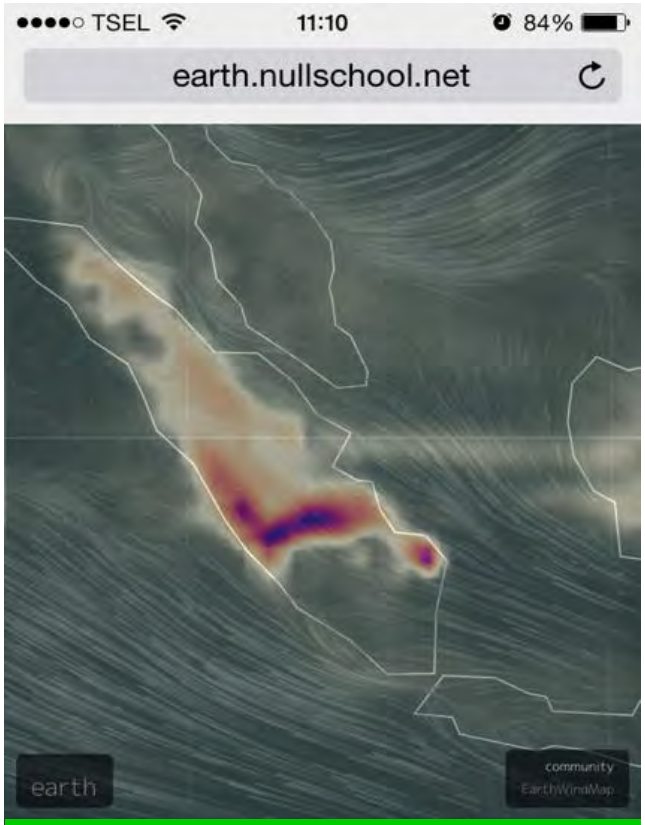
PALANGKARAYA, Jam 0 : 731.68
PALANGKARAYA, Jam 1 : 883.63
PALANGKARAYA, Jam 2 : 1040.14
PALANGKARAYA, Jam 3 : 1168.58
PALANGKARAYA, Jam 4 : 1249.34
PALANGKARAYA, Jam 5 : 1334.00
PALANGKARAYA, Jam 6 : 1383.51
PALANGKARAYA, Jam 7 : 1448.12
PALANGKARAYA, Jam 8 : 1643.71
PALANGKARAYA, Jam 9 : 1857.07
PALANGKARAYA, Jam 10 : 1958.89
PALANGKARAYA, Jam 11 : 1995.02
, Jam 12 : 0.00
PALANGKARAYA, Jam 13 : 1986.73
PALANGKARAYA, Jam 14 : 1936.44



PM10 concentration in Palangkaraya on 19 October 2015 reached 2,000 µgram/m^3

http://borneonews.co.id/berita/23367-asap-kuning-kota-palangka-raya-bagai-neraka

Statistics of Fires



25 October 2015

IMPACTS

"500,000 people have developed respiratory symptoms because of smoke released by this year's fires" (National Board for Disaster Management /BNPB 2015).

"Livelihoods of some 75 million people in Indonesia and the region…." (Forest News 2015)

Schools and universities were closed

Photo: Antara

IMPACTS

- Many flights were delayed or canceled.
- The fires have cost the Indonesian government more than US$30 billion (Guardian 2015).

  MYR 128 bil

  YEN 3.6 tril.

  TTHB 1 tril.


REUTERS EDITION: UK SIGN IN | REGISTER Search Reuters

HOME BUSINESS MARKETS WORLD UK TECH MONEY OPINION BREAKINGVIEWS SPORT LIFE PICTURES VIDEO

World | Mon Oct 5, 2015 11:19am BST Related: WO

Malaysia PM urges Indonesia to tackle fires, haze drifts to Thai sky

The Jakarta Post Custom Search

News Views Life TRAVEL COMMUN

Editor's Choice Business National Archipelago

Singapore upset by RI's haze

Voice of America

HOME USA AFRICA ASIA MIDEAST EUROPE TECH HEALTH ENTE

News / Asia

Southern Thailand Hit by Worst Haze from Indonesia Ever


DAWN

Philippines cancels flights, alerts hospitals over haze

AFP — UPDATED OCT 26, 2015 11:10AM

The Singapore government has a special website http://www.haze.gov.sg/

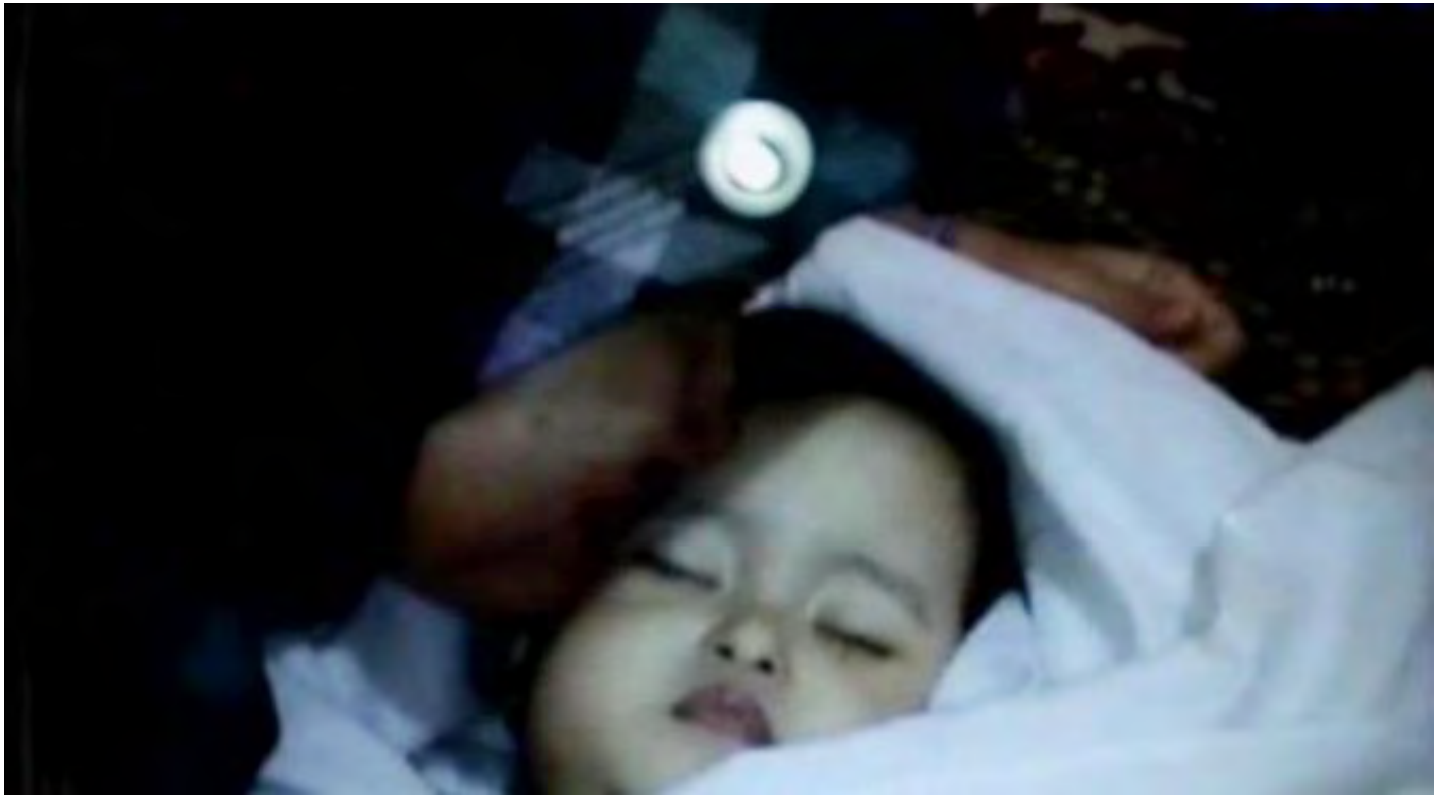


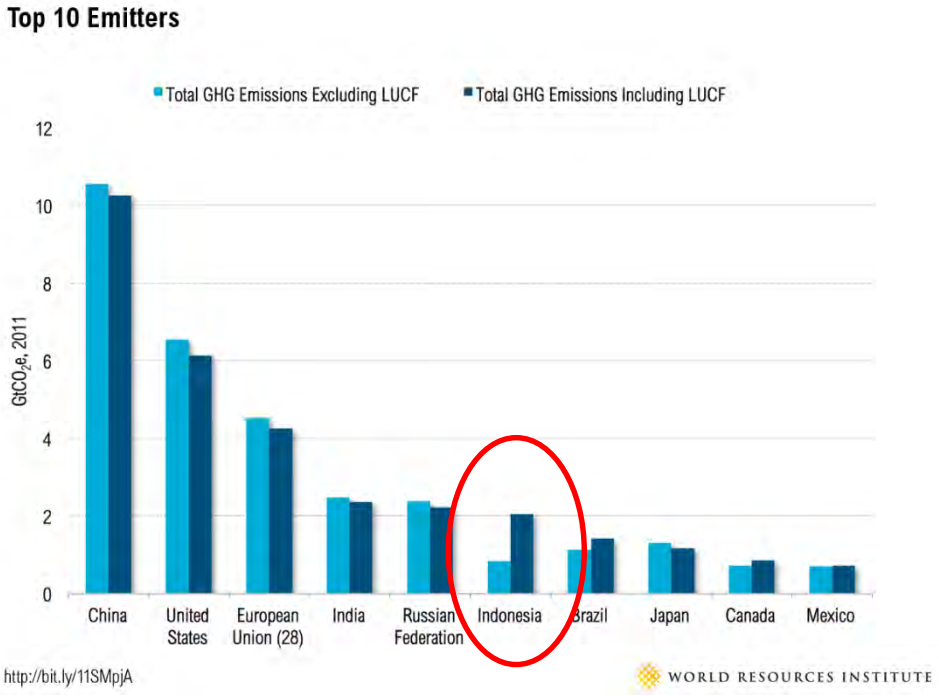
Photo: Liputan 6

MINISTER OF SOCIAL AFFAIRS: 19 CHILDREN DIED DUE TO HAZE

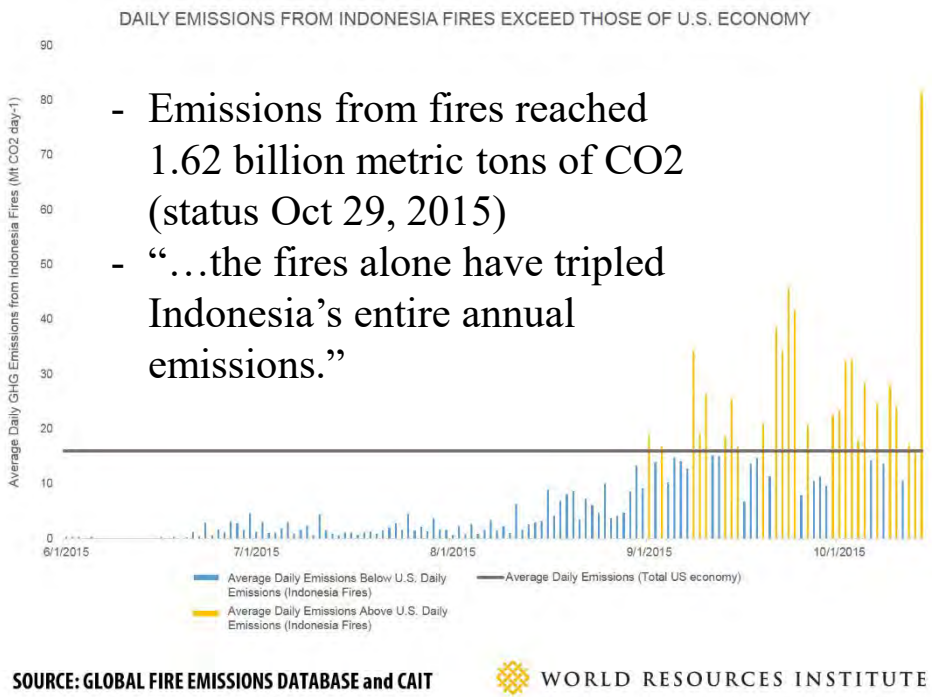
Central Kalimantan (5)
South Sumatera (5)
Riau (5)
South Kalimantan (3)
Jambi (1)

http://nasional.kompas.com/read/2015/10/28/11514061/Mensos.19.Orang.Meninggal.karena.Kabut.Asap

IMPACTS



"…. with emissions from deforestation and land-use change taken into account, Indonesia becomes the most intensive emitter" (WRI 2014)



- Emissions from fires reached 1.62 billion metric tons of CO2 (status Oct 29, 2015)
- "…the fires alone have tripled Indonesia's entire annual emissions."

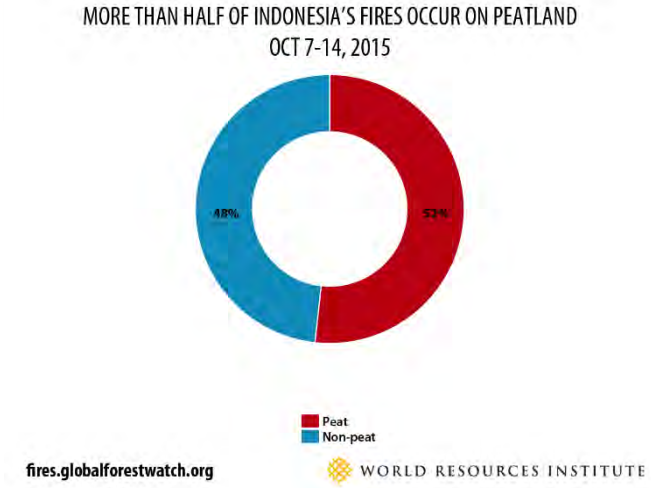
"…since September have generated emissions each day exceeding the average daily emissions from all U.S. economic activity" (WRI 2015)

ROOT OF PROBLEMS

- The forest fires are set partly to clear land for palm oil plantations.

  "Areas have just burnt in Nyaru Menteng Palangkaraya is now planted with oil palm. After the fire, oil palm rises" (a tweet from Mr. Nugroho, Head of Data, Information, and Public Relations of the National Disaster Management Agency).

ROOT OF PROBLEMS



- More than half of the fires have occurred on peatland areas (WRI 2015) that was formed approximately 360 million years ago – organic wastes fill in the swamp (HutanRiau 2015).
- It is extremely difficult to put out the peatland fires since the fire go below the ground.
- The burning of tropical peatlands is significant for GHG emissions because these areas store some of the highest quantities of carbon on Earth, accumulated over thousands of years.
- Fires also emit methane, a greenhouse gas 21 times more potent than carbon dioxide (CO2),
- Peat fires may emit up to 10 times more methane than fires occurring on other types of land.

Peat with depths over 3 meters should be used as a protected area

ROOT OF PROBLEMS

- Government Regulation PP No. 71 Tahun 2014 : Prohibition of using of peatland.

  "Peatlands with the depths over 3 meters shall be made as protected areas, including those are currently used as concession areas"

- 4.1 ha of the total 8.9 ha area of Riau is peatland:
  - 1 million ha is concession area mainly for pulp and paper industries,
  - 1 million ha is oil palm plantation
  - 0.5 million ha is other plantation and agriculture.

ROOT OF PROBLEMS

Natural
Peat Swamp

Canals built to
drain water

Stored water drained
out through the canals

The land
is burned

Resources used
to fight fires

Land is ready
for planting

- ACTORS
  - Corporates
    - Forest concession for industry
      - Plantations
  - Government
    - Infrastucture
  - Local People
    - Plantations

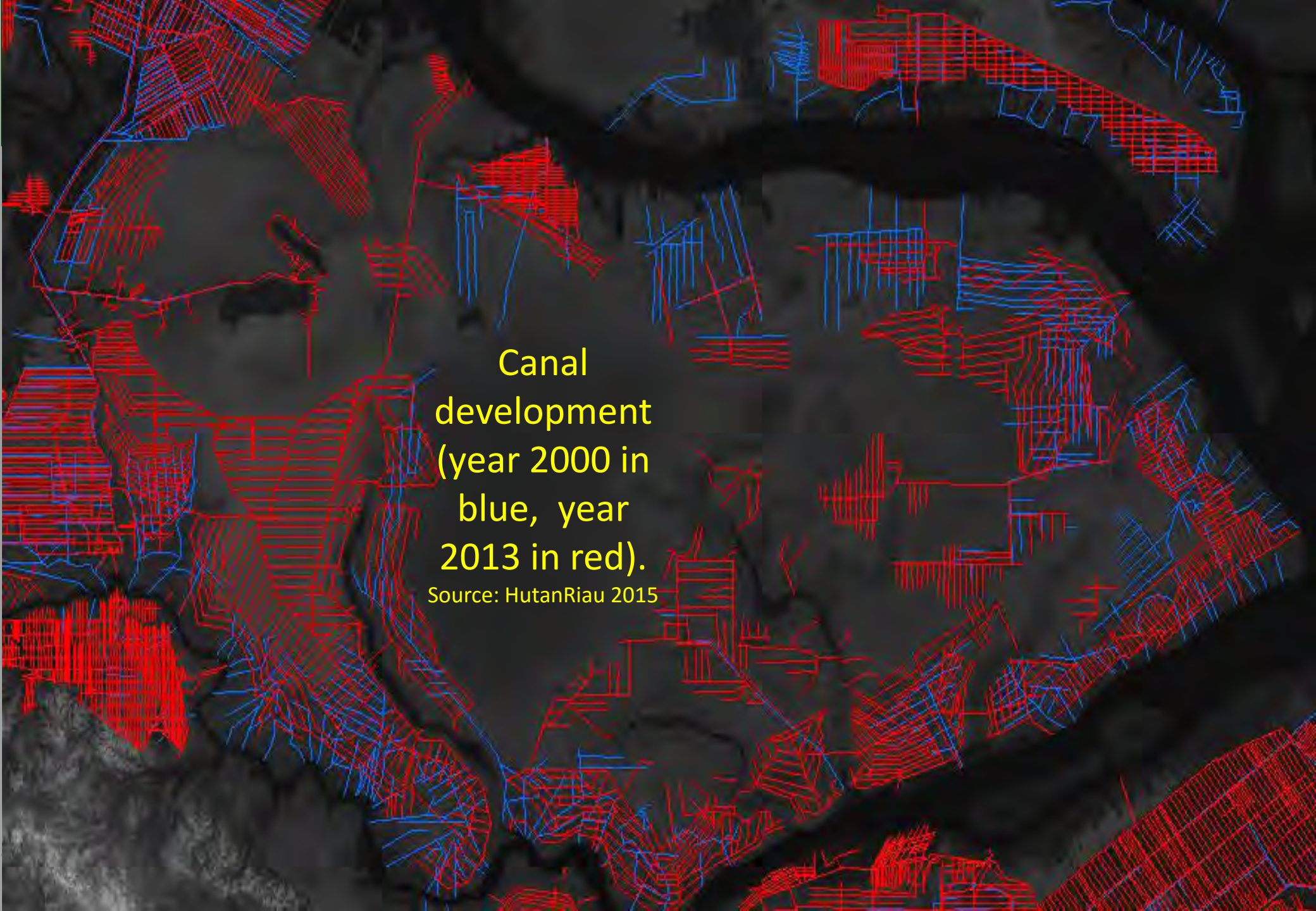
Adapted from: HutanRiau

Cost of land clearing methods:

- Burning: Rp. 1 Mil.
- Non burning: 15 Mil.

Source: PT Musim Mas via Detik Com


MONGABAY.COM



Canal development (year 2000 in blue, year 2013 in red).

Source: HutanRiau 2015

MITIGATION

Some strategies identified:

1. To evaluate regulations that allow for making fire for land clearing.
2. To re-evaluate current land uses on the peat lands and to restore peat lands into protected area
3. Supervision to corporates with concession rights integrated with corporate self-regulation mandates.
4. To set up “Fire Care” movement in local community levels.
5. Sustainable water management to ensure peat land wet.
6. To construct canal blocks in burnt areas.
7. Capacity building (government, corporates, communities).
8. Law enforcement.
9. Research to better understanding the causes, actors , and impacts of fires and more effective mitigation strategies on the environment (e.g. GHG emission, biodiversity, ect.), trans-boundary issues, health, economy, etc.
10. To develop integrated information management related to land and forest fires (e.g. early warning system and management, map development, etc.).
11. To formulate and apply more sustainable standards for palm oil and pulp and paper production.

http://edition.cnn.com/2015/10/29/asia/southeast-asia-haze-crisis/

http://cdn.tmpo.co/data/2014/03/05/id_269071/269071_620.jpg

http://www.cbc.ca/news/world/indonesian-fires-fuel-hazardous-haze-1.1338524

http://40.media.tumblr.com/dcbc9dced4541595b33ed6f35eafe566/tumblr_nup0gato5O1rkomyqo1_1280.jpg

http://mashable.com/2015/10/16/indonesia-peat-fires-carbon-bomb/


AP Images


www.antaranews.com

http://mashable.com/2015/10/26/indonesia-haze-crisis-global-warming/

http://mashable.com/2015/10/26/indonesia-haze-crisis-global-warming/

foto: shodik purnomo

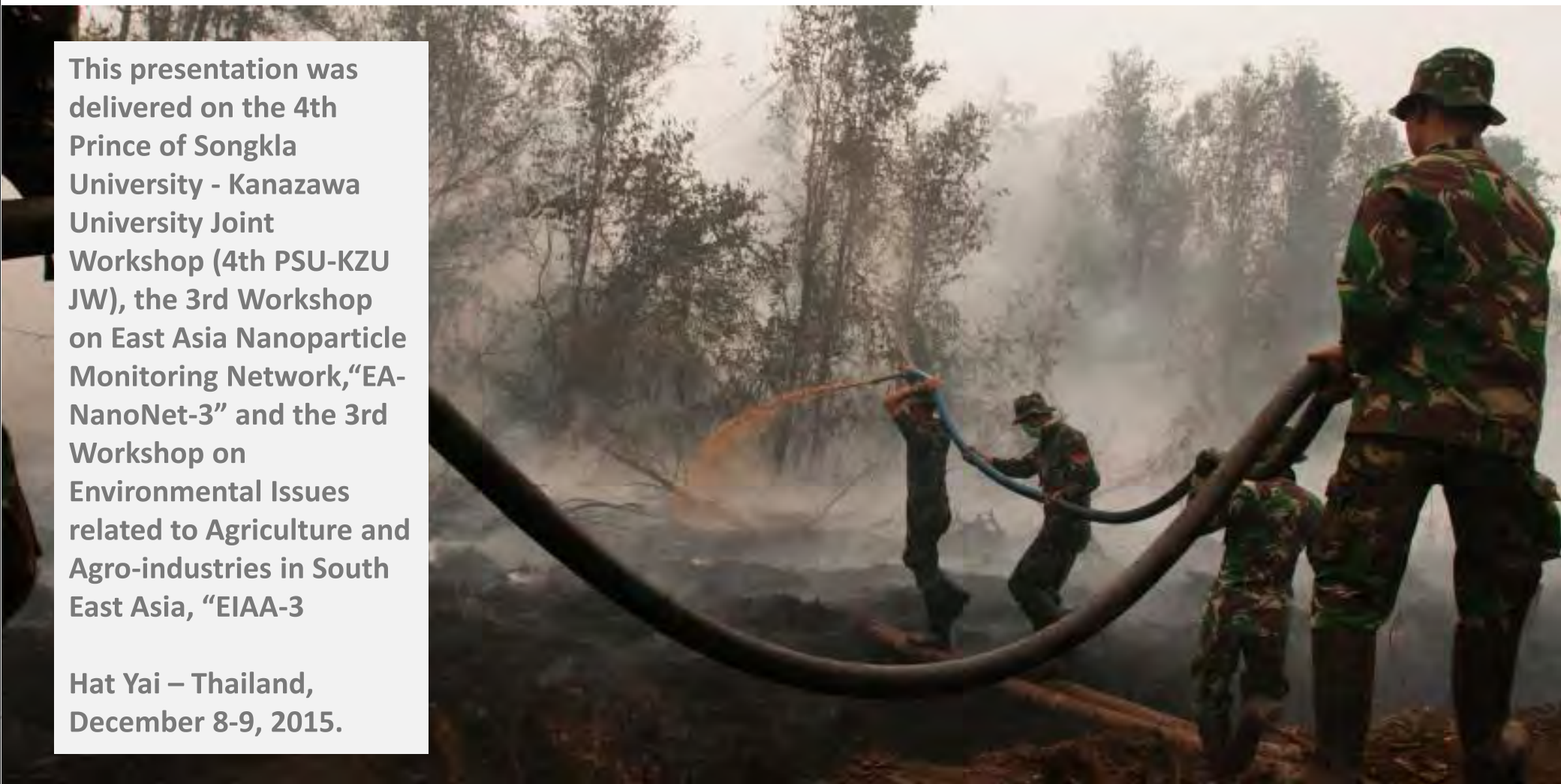
TWO DECADES OF BREATHING THE HAZE:

an Epic from Riau

"crime against humanity"

UIN SUSKA RIAU

EnReach
Energy Research Center



This presentation was delivered on the 4th Prince of Songkla University - Kanazawa University Joint Workshop (4th PSU-KZU JW), the 3rd Workshop on East Asia Nanoparticle Monitoring Network,"EA-NanoNet-3" and the 3rd Workshop on Environmental Issues related to Agriculture and Agro-industries in South East Asia, "EIAA-3

Hat Yai – Thailand, December 8-9, 2015.