



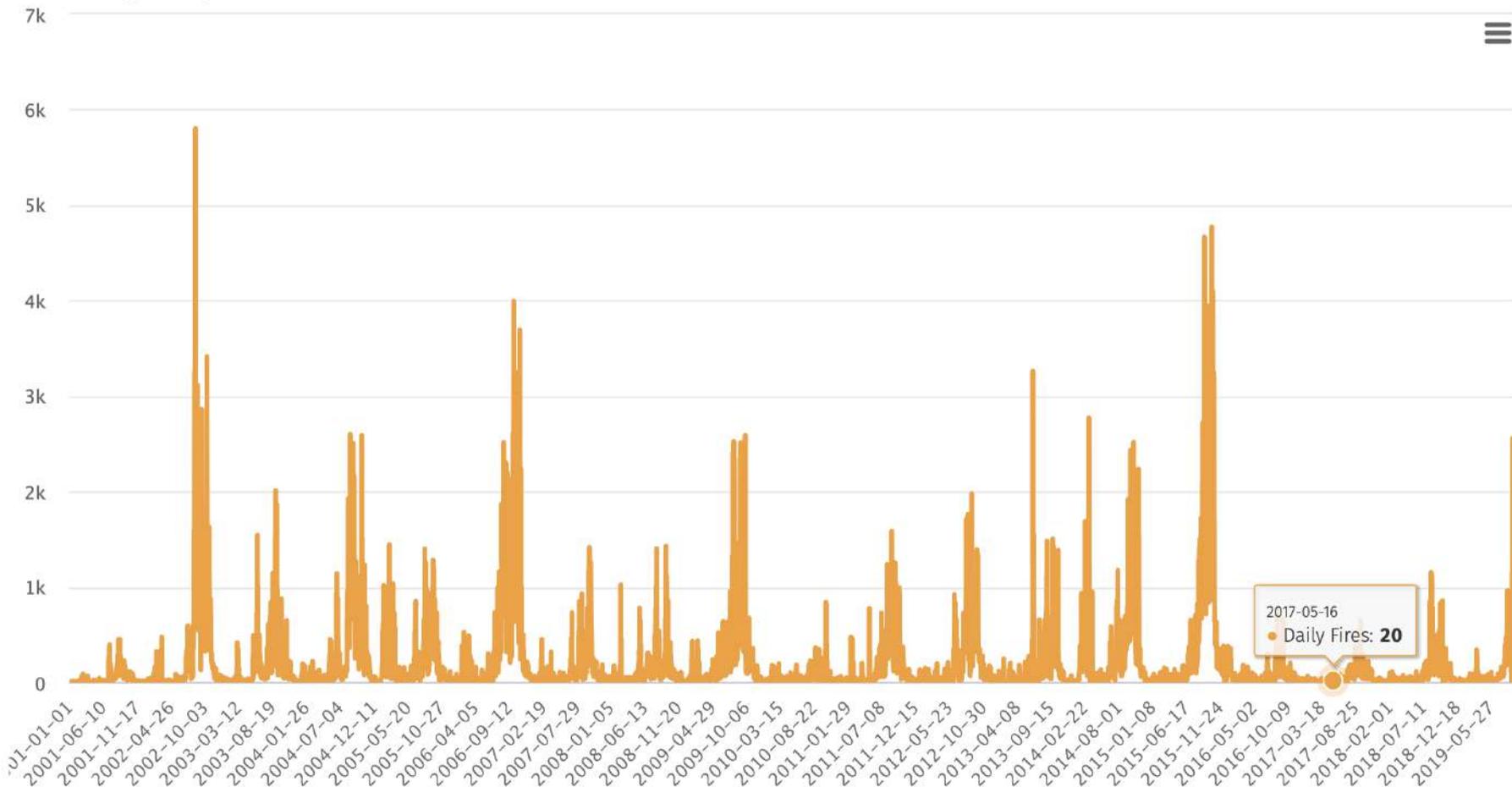
Fires and haze in Indonesia:  
Current policies and some priorities for  
research

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Australian National University

## FIRE ALERT COUNT JAN 1, 2001 - PRESENT

### MODIS fire alerts

Click and drag in the plot area to zoom in





Antara/Virnia Puspa Setyorini

**Fire hazard:** An aerial photo shows forest fires in Riau on Thursday. The US National Ocean and Atmospheric Administration (NOAA) satellite has detected 148 fires throughout the province.

# Only rain can help S'pore now

Anggi M. Lubis and Rizal Harahap

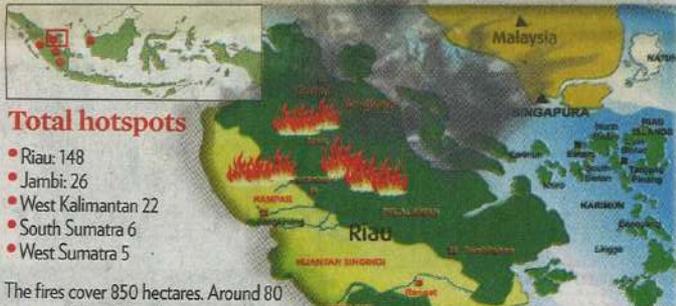
THE JAKARTA POST/JAKARTA/PEKANBARU

As haze from forest fires in Sumatra wreaked havoc on the prosperous city-state of Singapore, Indonesian government have suggested an imminent downpour as the only way to bring an end to the crisis.

Forestry Ministry general secretary Hadi Daryanto said on Thursday that Indonesia could not guarantee that necessary measures taken to combat the fires will be effective.

- » Possibility of heavy downpour in a week's time is only chance to clear haze
- » Authorities in Sumatra overwhelmed by sheer scale of fires

cial rain," said Hadi. The ministry, which is responsible for preventing and combating forest fires across the archipelago, has used water bombing and de-



are the worst-impacted areas, according to Riau Disaster Mitigation Agency. "No one knows when the fires will abate. The problem is just too big to handle. We need more and immediate help from the central government," said the agency's head, Said Saqlul Amri.

The Dumai municipality, a base for US energy giant Chevron, has set the highest level of pollution warning due to the haze.

Authorities have suspended flights to and from Pinang Kampai

FOREST

Singapore  
denied  
action  
Ri

Reuters

SINGAPORE

Singapore for "defining Indonesia as a healthy level because of forest fires disrupting the city."

Work at construction workers supervisor its delivery military training.

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# The ASEAN Agreement on Transboundary Haze Pollution

- The ASEAN Agreement was signed in 2001
- The majority of the countries (6 out of 10 ASEAN countries) had ratified by 2004, and it entered into force in 2004
- Indonesia was the last country to ratify the Agreement, in October 2014 and deposited the instrument in January 2015
- A major fire event took place in 2015
- It marked a change in fire policy in Indonesia, the President demanded action

# Indonesia sets global example on fighting forest fires



There were 2,400 hot spots detected in the first nine months of 2017 in Indonesia, a 32 percent decline from the same period in 2016

Image: REUTERS/ Antara Foto/Bayu Pratama

<https://www.weforum.org/agenda/2019/09/as-the-amazon-burns-indonesia-shows-world-how-to-fight-forest-fires/>

# Indonesia battles forest fires, criticism from neighbours over toxic haze

By [Max Walden](#)

Posted yesterday at 10:55pm



**PHOTO:** The Sebangau National Park area in Palangkaraya, Central Kalimantan, is at the centre of recent fires.  
(Reuters: Willy Kurniawan)

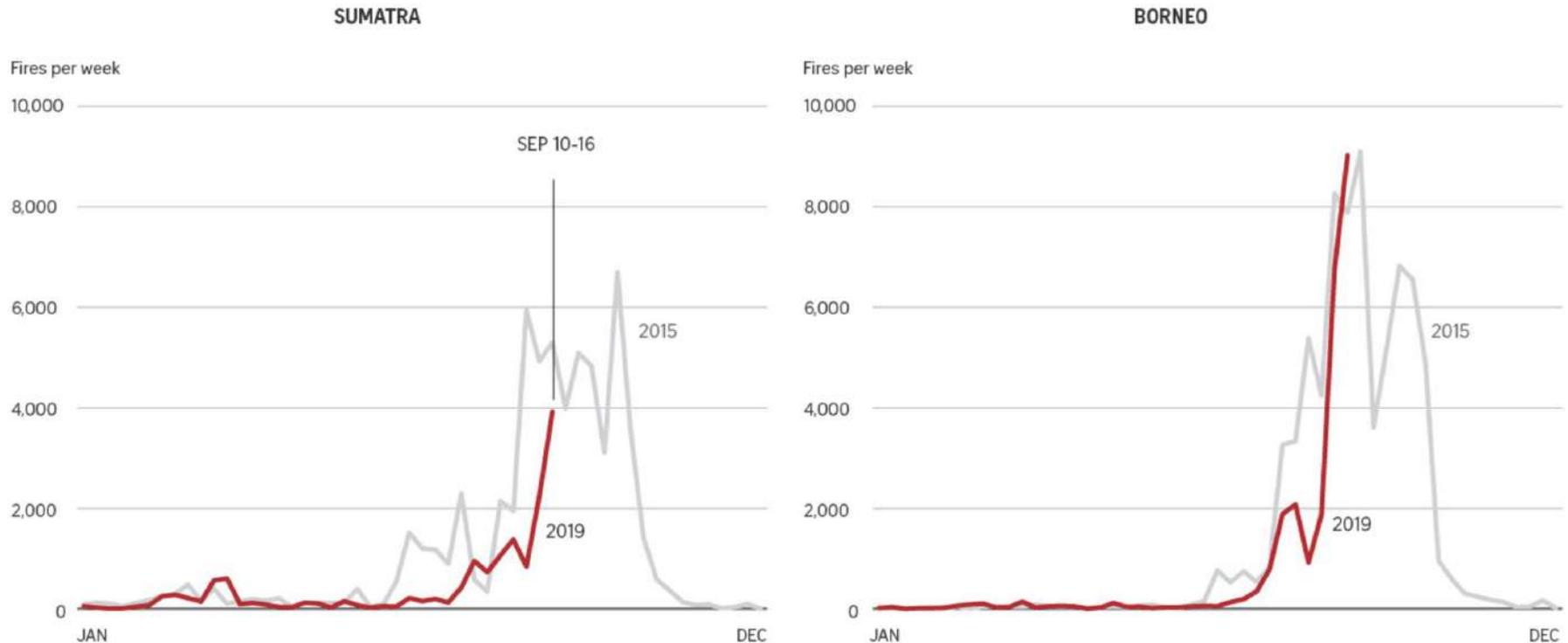
<https://www.abc.net.au/news/2019-09-16/indonesia-forest-fires-explainer/11518688>



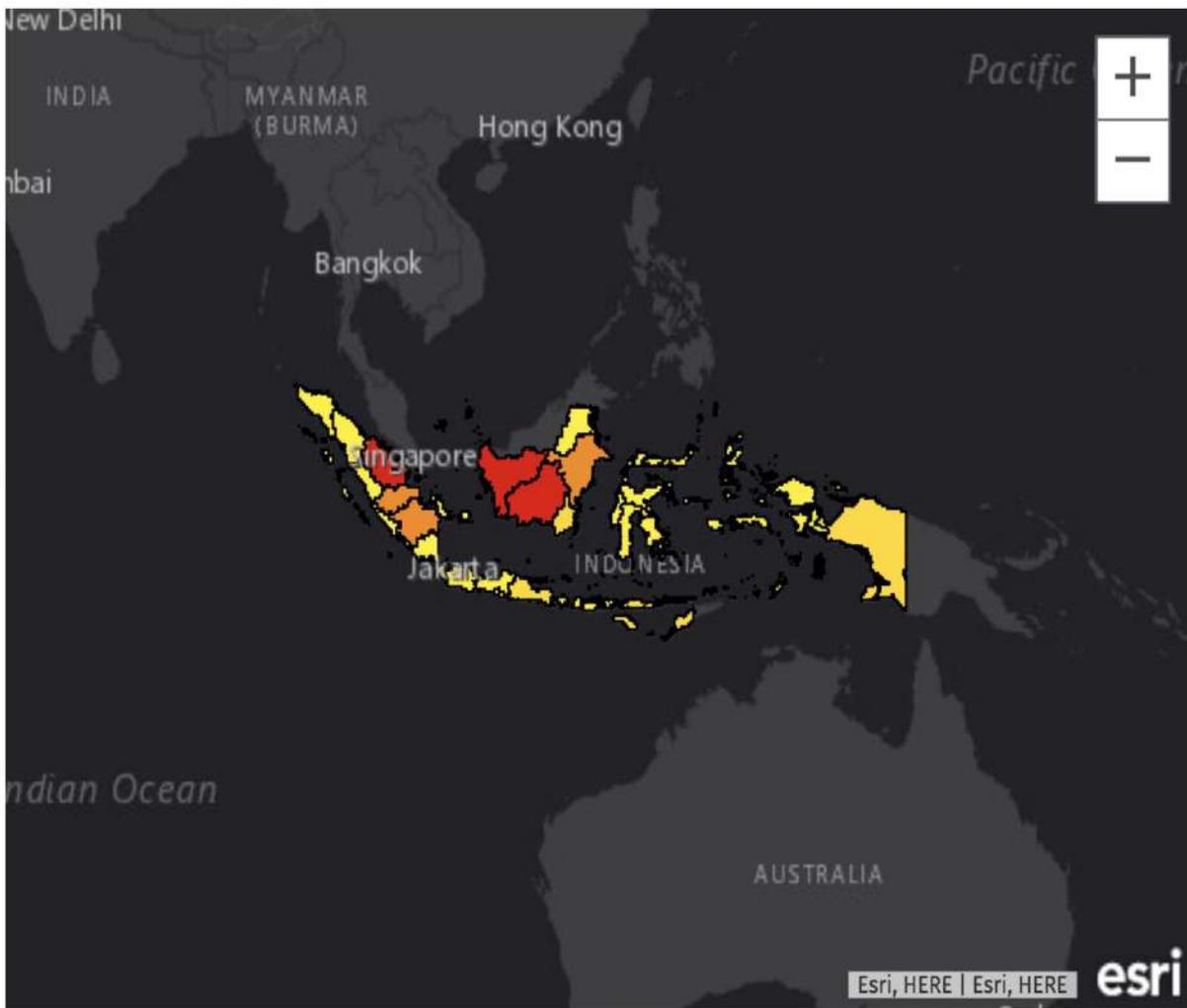
A member of the East Tanjungjabung Fire Brigade attempts to put out a fire in the Londerang protected peatland forest area in Jambi. (JP/Jon Afrizal)

The Jakarta Post, 22/9/2019

# Comparing 2015 and 2019 fires



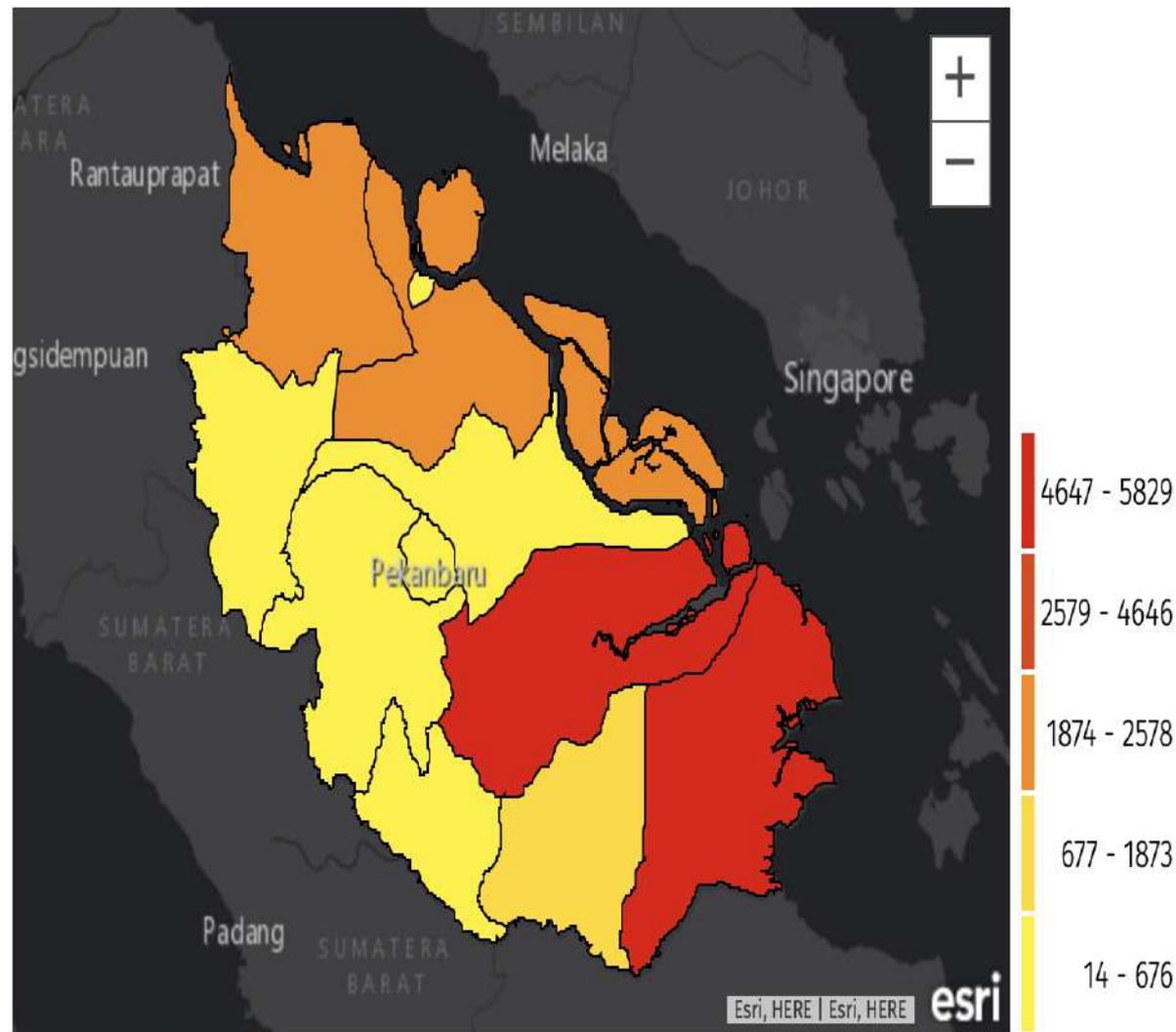
## GREATEST NUMBER OF FIRE ALERTS BY PROVINCE 1 AUG 2019 - 16 SEP 2019



Province	#
Kalimantan Tengah	33322
Kalimantan Barat	32922
Riau	17856
Jambi	12261
Sumatera Selatan	8804
Kalimantan Timur	5950
Nusa Tenggara Timur	5541
Kalimantan Selatan	5498
Papua	3909
Jawa Timur	3057

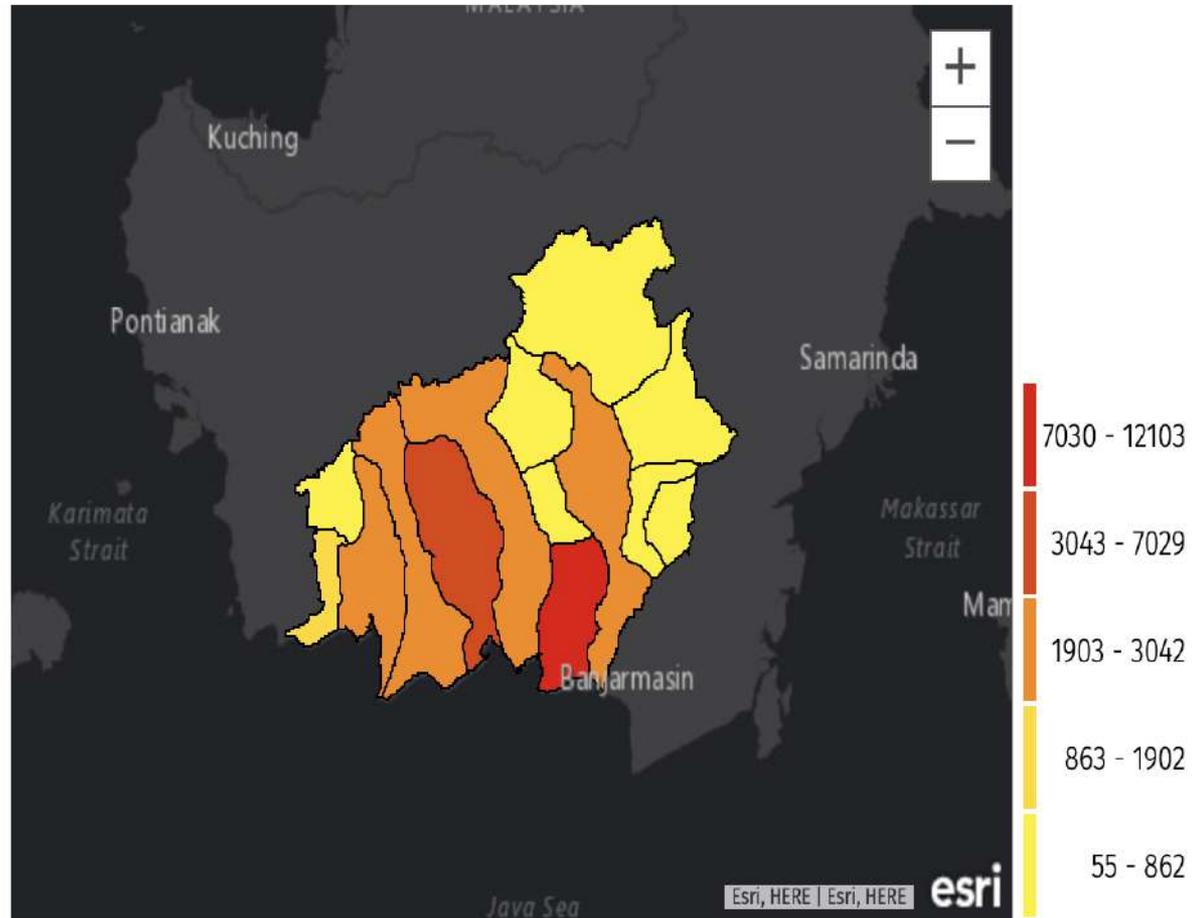
# GREATEST NUMBER OF FIRE ALERTS BY MUNICIPALITY 1 AUG 2019 - 16 SEP 2019

Subregion	Province	#
Indragiri Hilir	Riau	5829
Pelalawan	Riau	4646
Bengkalis	Riau	2578
Rokan Hilir	Riau	1873
Indragiri Hulu	Riau	1666
Siak	Riau	676
Kampar	Riau	233
Kuantan Singingi	Riau	188
Rokan Hulu	Riau	96
Pekan Baru	Riau	57



# GREATEST NUMBER OF FIRE ALERTS BY MUNICIPALITY 1 AUG 2019 - 16 SEP 2019

Subregion	Province	#
Pulang Pisau	Kalimantan Tengah	12103
Kotawaringin Timur	Kalimantan Tengah	7029
Kapuas	Kalimantan Tengah	3042
Seruyan	Kalimantan Tengah	3025
Kotawaringin Barat	Kalimantan Tengah	2395
Katingan	Kalimantan Tengah	1902
Sukamara	Kalimantan Tengah	1164
Palangka Raya	Kalimantan Tengah	862
Barito Timur	Kalimantan Tengah	540
Barito Selatan	Kalimantan Tengah	381



## USE OF FIRE BANNED IN AGRICULTURE

- Use of fire not allowed for land clearing in plantations
- Small scale farmers supposed to be allowed to burn for agricultural purposes up to 2 ha with permit from village head
- But police often tells village heads not to issue permits or face jail

# FIRE PREVENTION AND SUPPRESSION AT COMMUNITY LEVEL

Fire prone villages are identified

Patrols are increased

Patrol members paid for by  
Ministry of Environment and  
Forestry



# FIRE PREVENTION ON PEATLAND

Peatland Rehabilitation Agency established in 2016

Masa Kerja

5 Tahun

Target Restorasi Gambut

± 2 juta hektar



30% pada tahun 2016



20% pada tahun 2016



20% pada tahun 2018

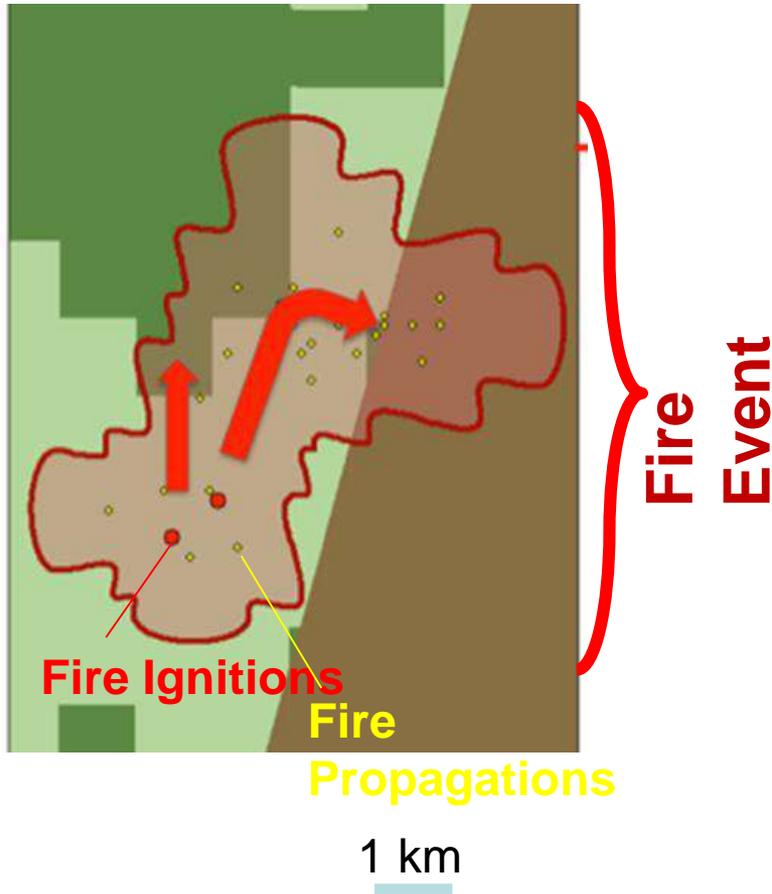


20% pada tahun 2019



10% pada tahun 2020

## UNDERSTANDING FIRE DISTRIBUTION AND SOURCES



### A. Burning observed as undifferentiated event, e.g., total burned area.

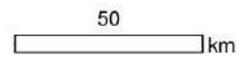
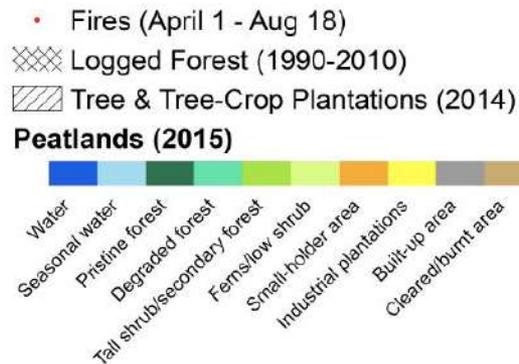
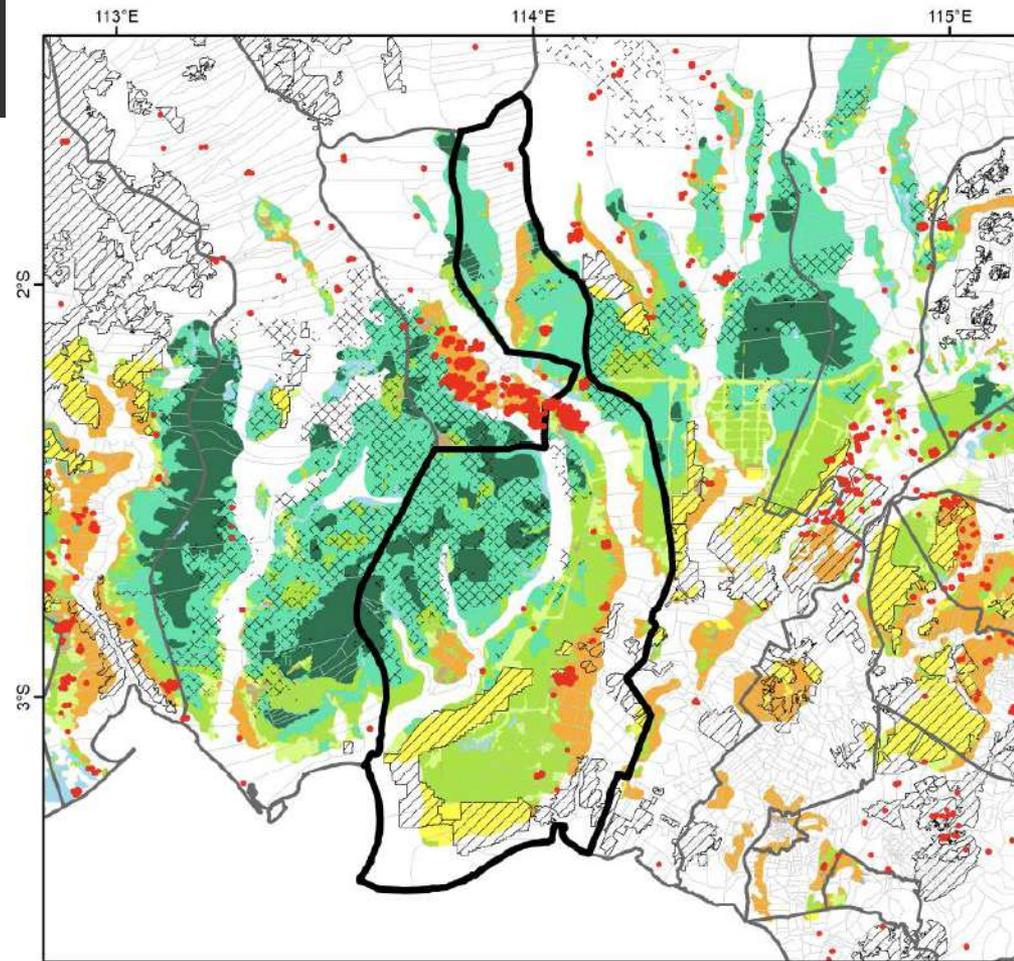
- Differentiate burned areas by
  - fire ignition,
  - fire propagation,
  - fire events (polygons)
- Observe fire ignitions and their related fire events by 'source land use'

### B. Smallholder land use overlooked

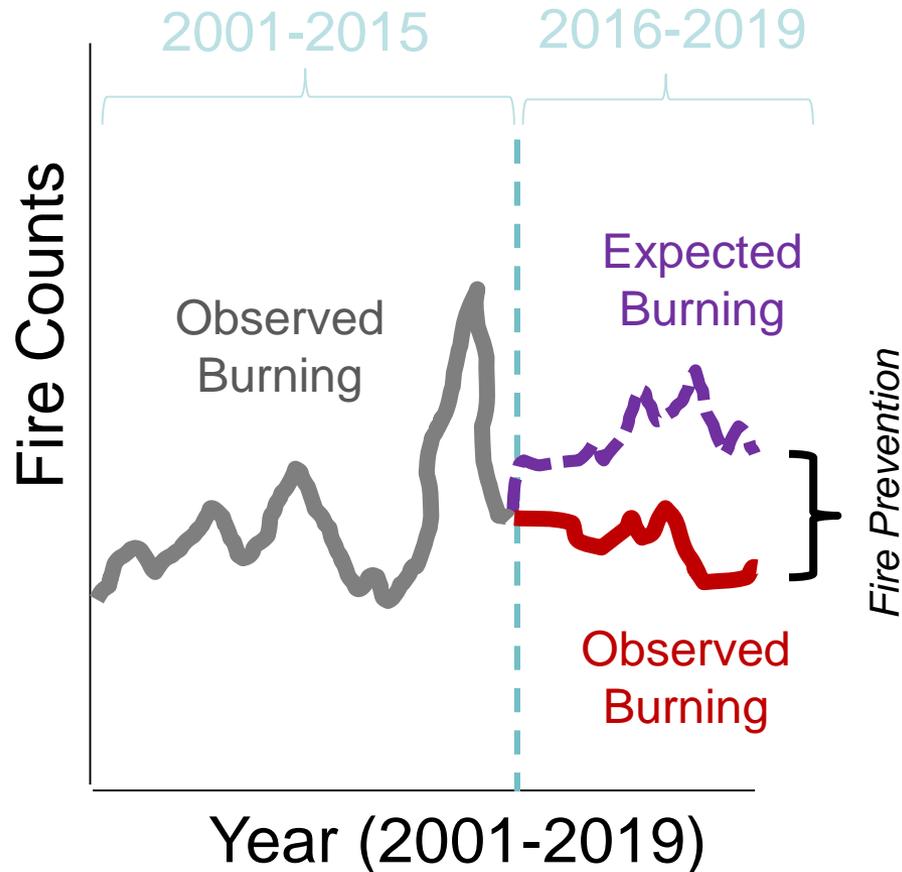
- Directly map smallholder land use, plus logging, plantations, for 2015 (ENSO), via Google Earth
- 627 fire-prone villages (11 Mha)



# Pulang Pisau district Central Kalimantan Province Hotspots in 2019

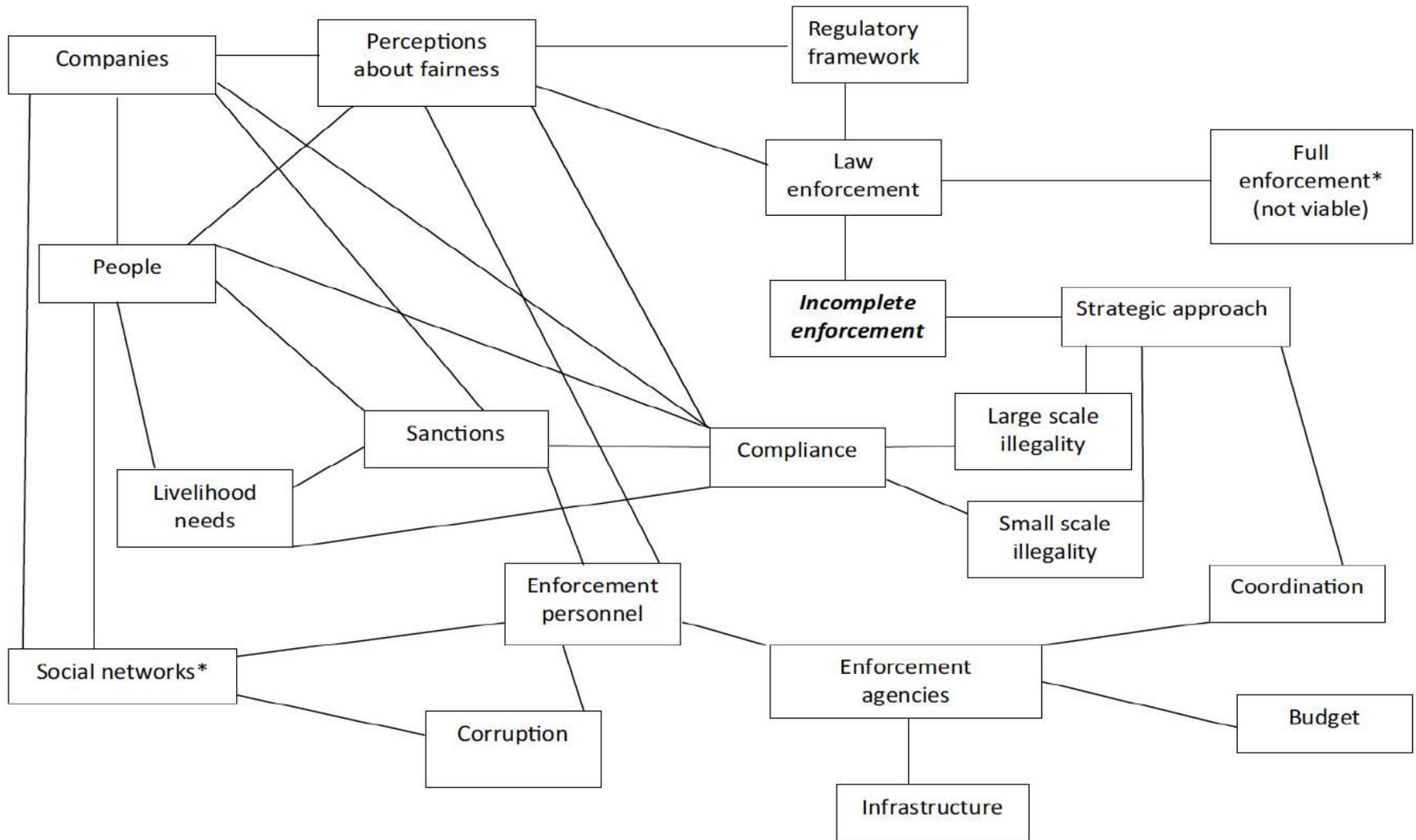


## UNDERSTAND EFFECTIVENESS OF TARGETED FIRE PREVENTION



A. Disentangle effects of climate and fire prevention on burning after 2015 for 627 fire-prone villages

## B. Assess the process and effectiveness of law enforcement



# ASSESS EFFECTIVENESS, EFFICIENCY AND EQUITY OF PEATLAND REHABILITATION

## Key questions:

- Why are current rehabilitation initiatives struggling to deliver on their targets?
- Are the rehabilitation approaches currently adopted the most efficient from an economic perspective?
- What are the equity implications of the current rehabilitation initiatives?

# Direct incentives for fire prevention



Contents lists available at [ScienceDirect](#)

## Forest Policy and Economics

journal homepage: [www.elsevier.com/locate/forpol](http://www.elsevier.com/locate/forpol)



## Incentivizing compliance: Evaluating the effectiveness of targeted village incentives for reducing burning in Indonesia

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