

Regional Knowledge Sharing Event | 27 April 2023

Agricultural Burning: Sectoral to Regional Impacts and Solutions



Challenges in the Implementation of Available Solutions to Reduce Open-Burning of Agricultural Residues and the Way Forward

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- Causes
- Effects

Part 2: Possible Solutions

- Engagement with farmer groups and government agencies
- Identified causes and solutions
- Challenges

Part 1: Situation of Open Burning of Biomass in Thailand



Biomass Open-burning in Thailand



Burning of Solid Waste

- Burning of open-dumped garbage
- Burning of trash and plant residues



Burning of Agricultural Residues (during and after harvesting)

- Rice
- Sugar Cane
- Corn/Maize



Forest Fire

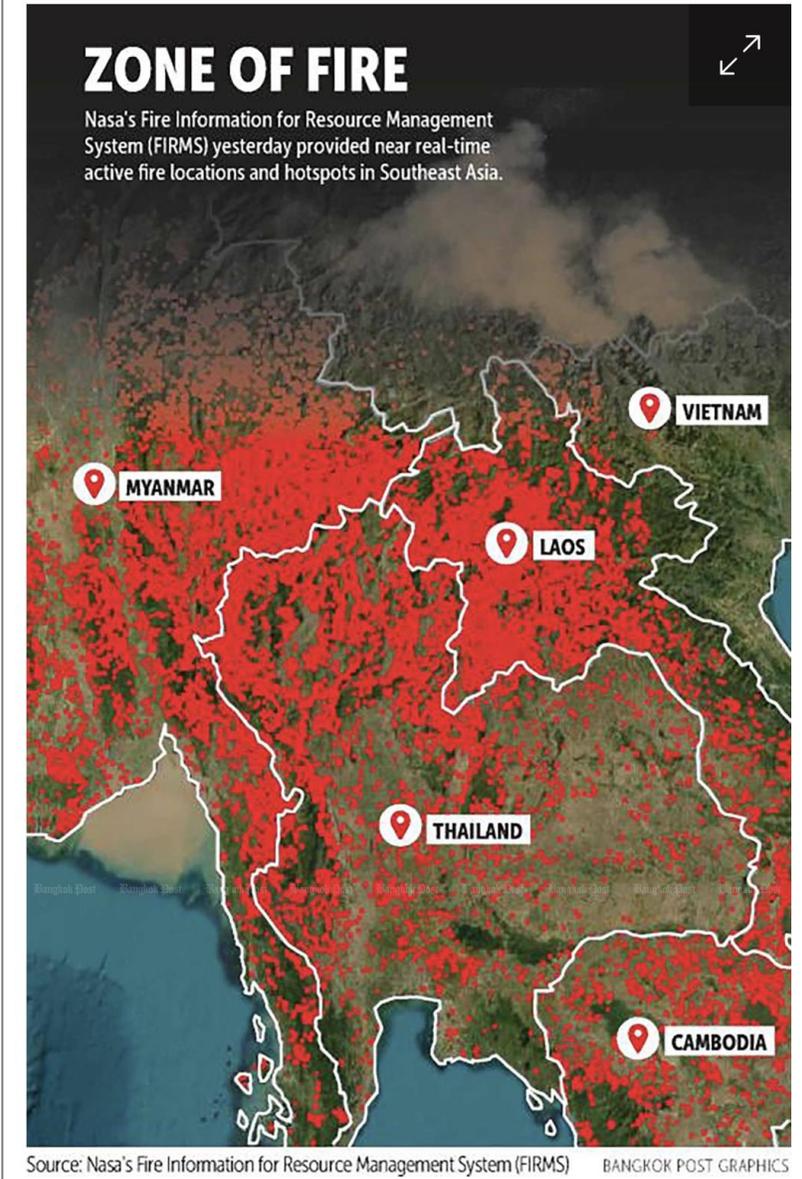
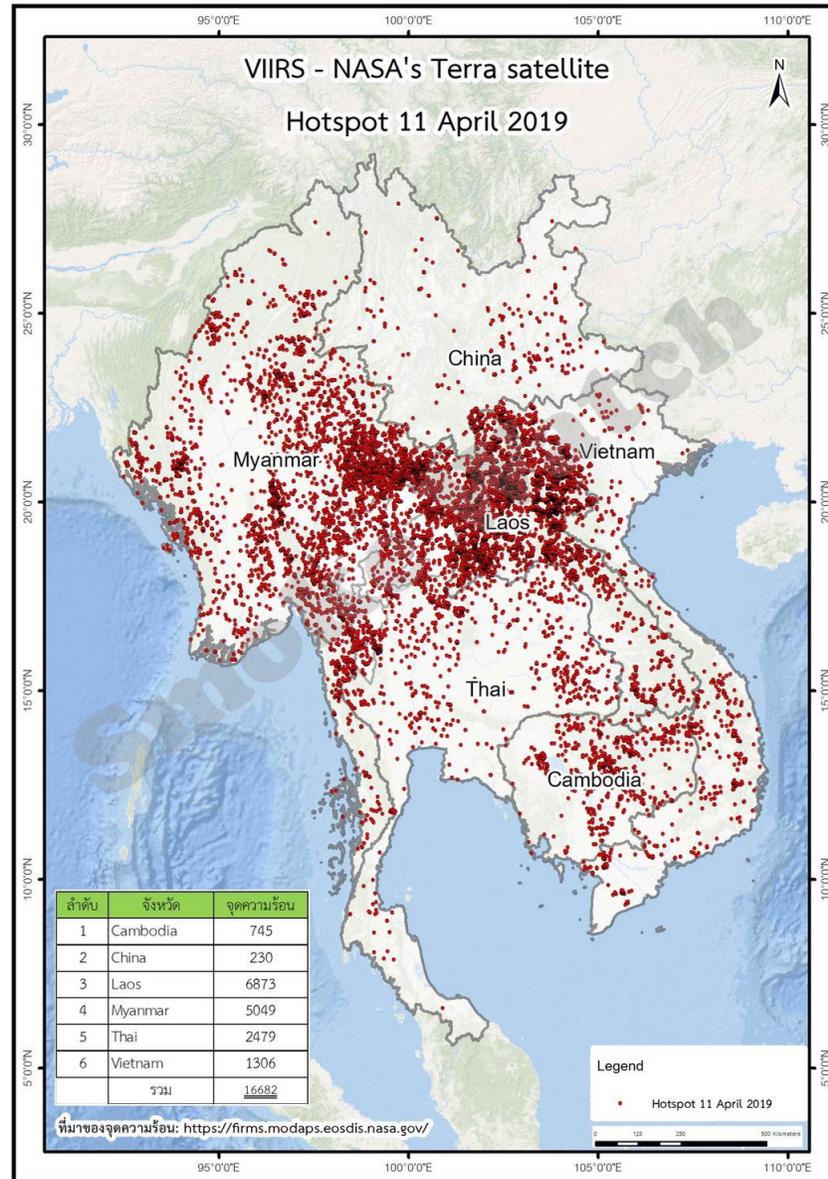
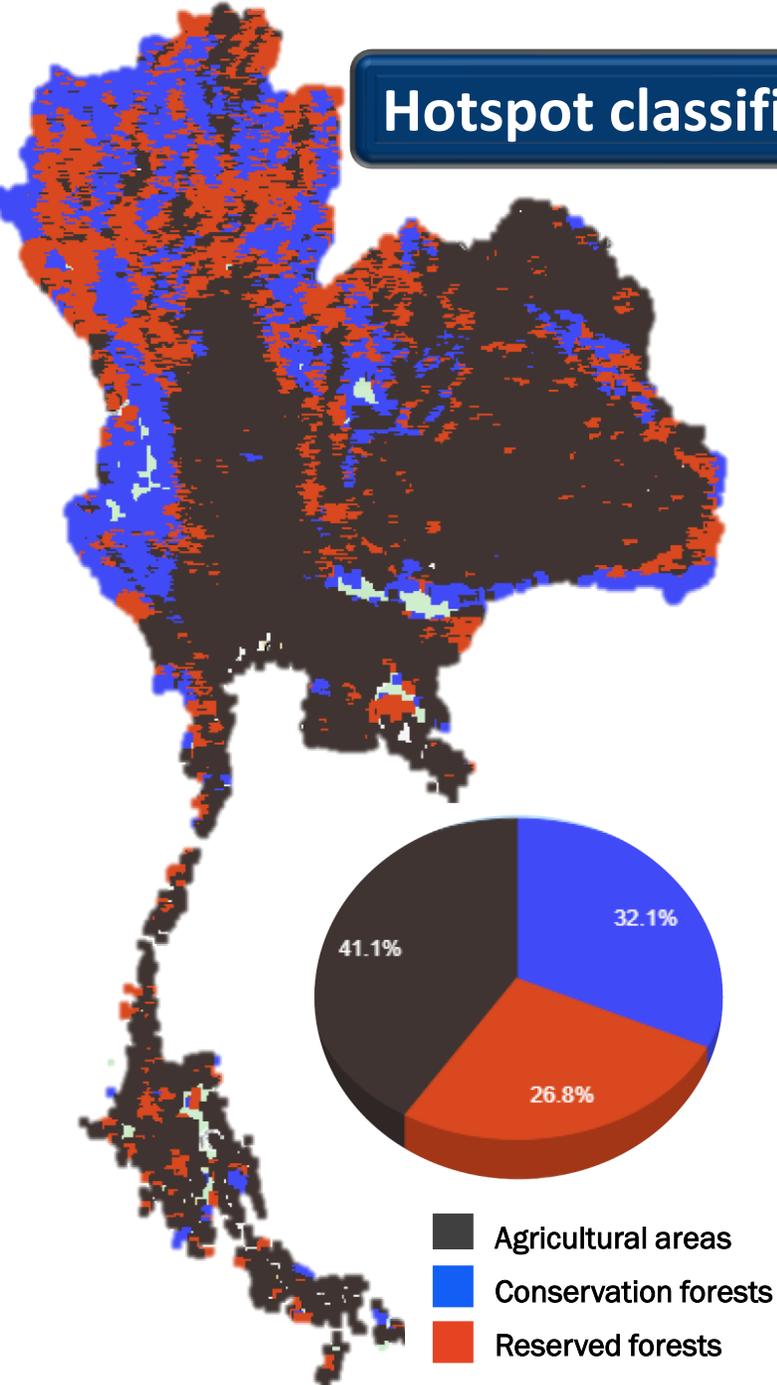
- Slash and burn agriculture
- Wild animal hunting
- Wild mushroom and plant harvesting



Land Clearing Fire



Hotspot classified by Types of Land Use in 2019

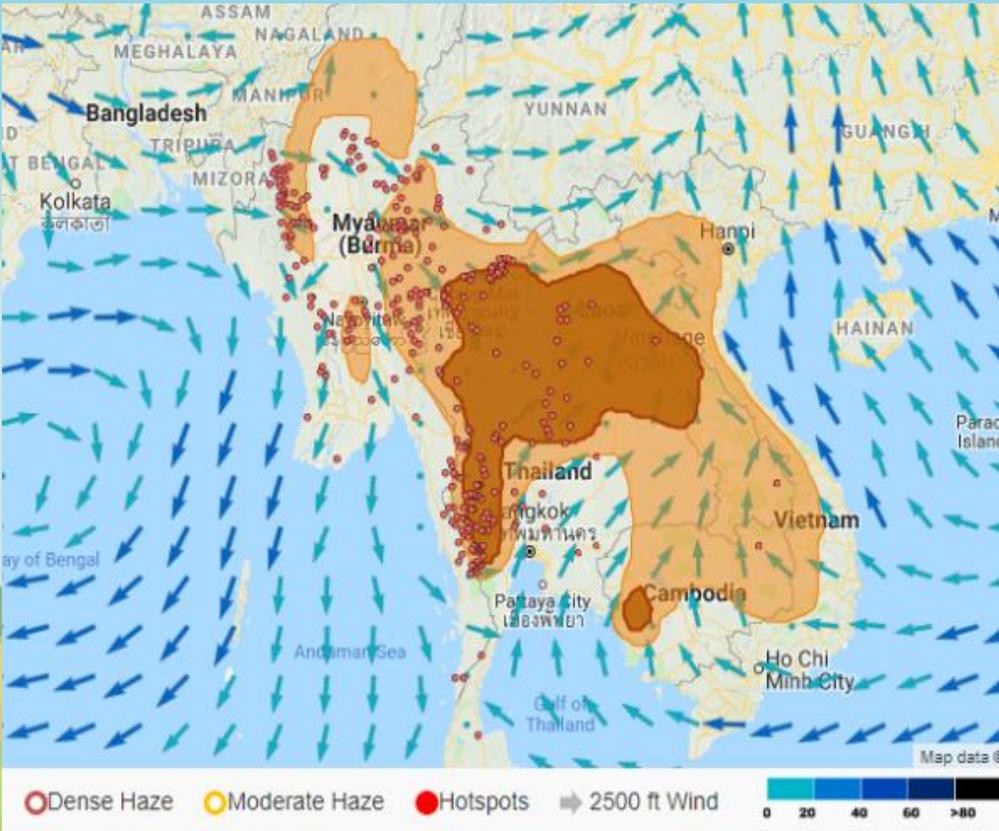


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ASEAN (Mekong Sub-Region) Haze and Hotspot Map on 13 March 2019 (ASMC)

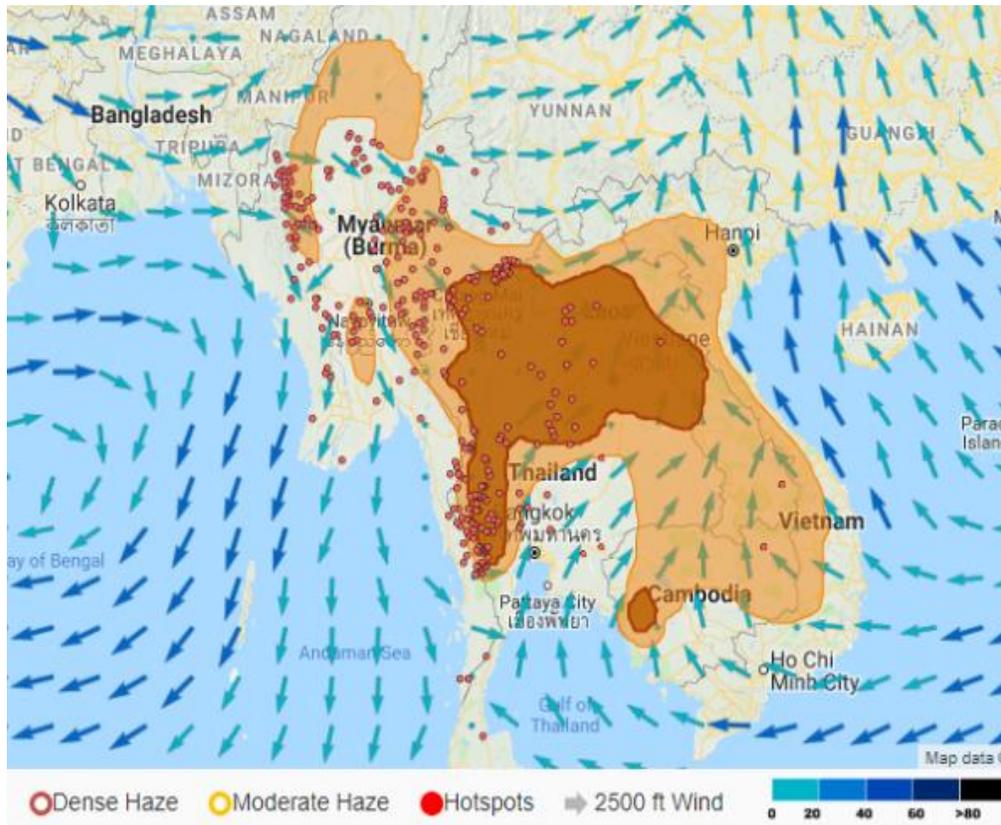


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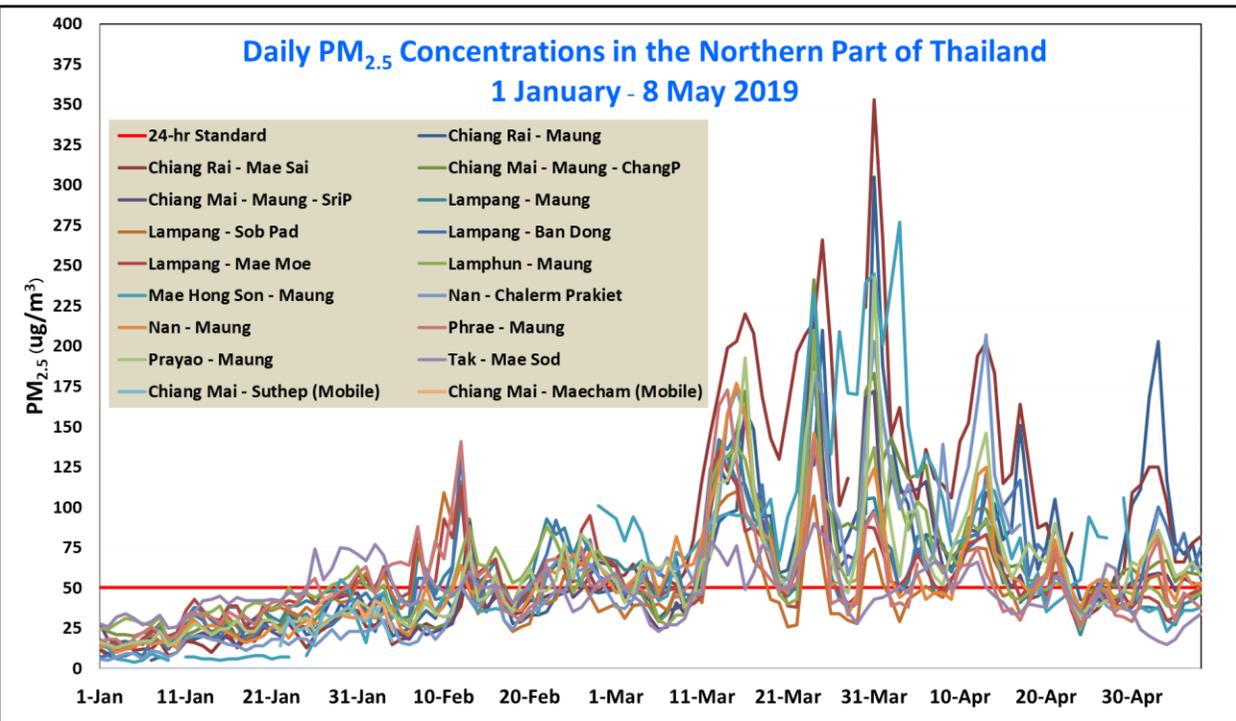
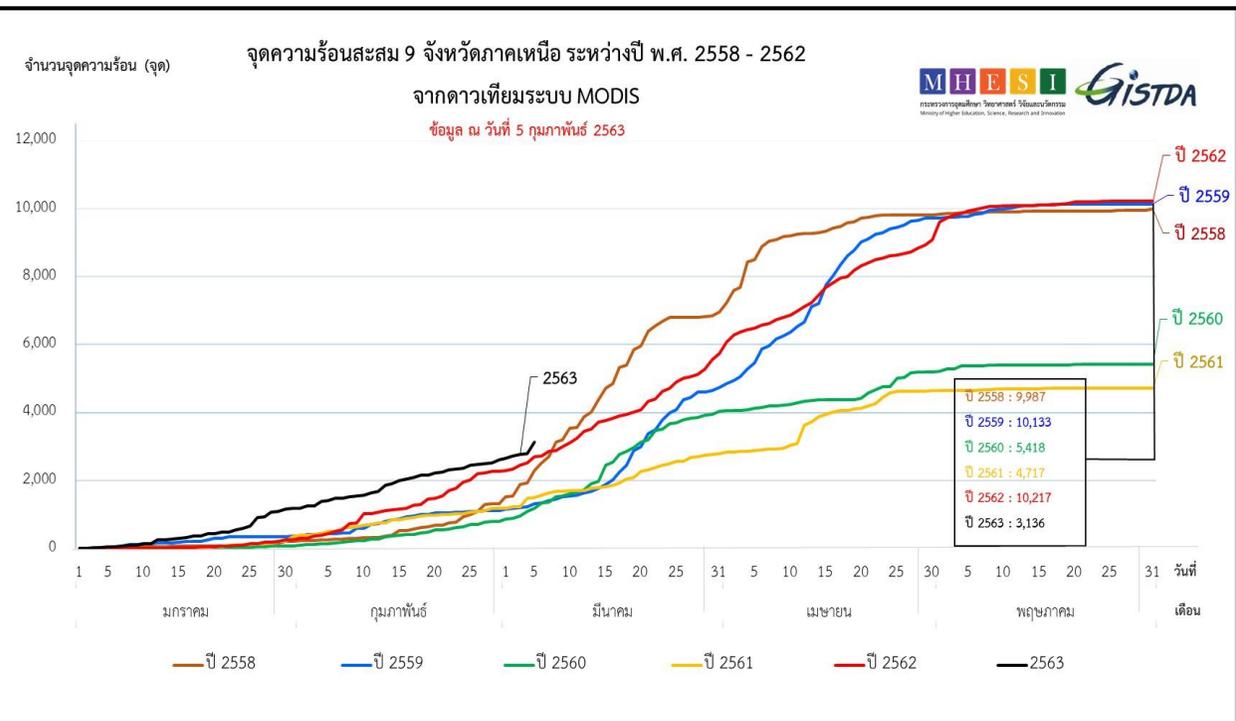
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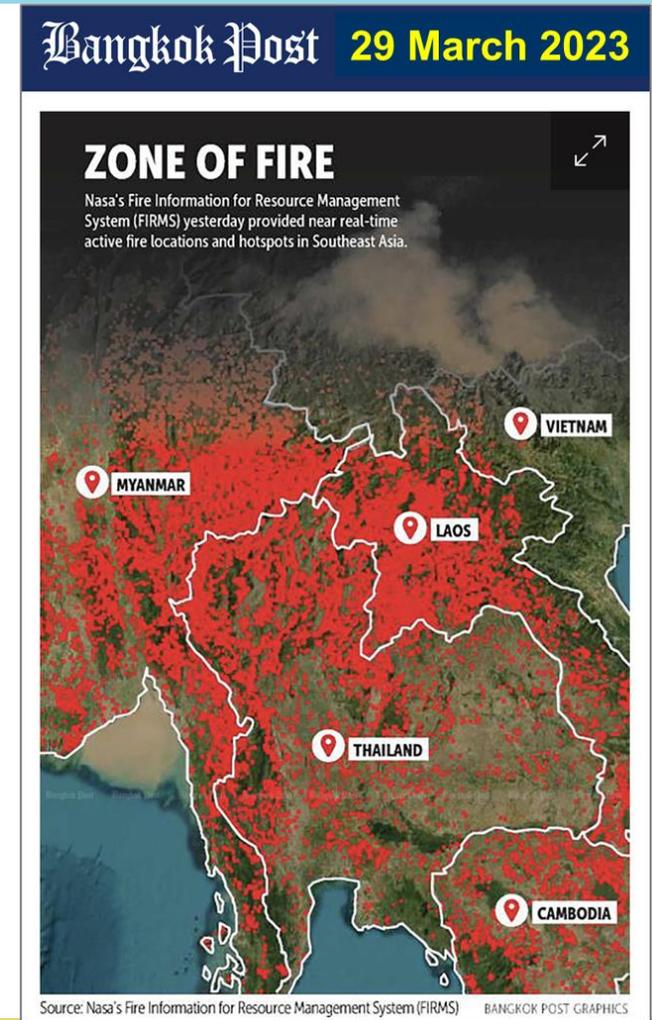
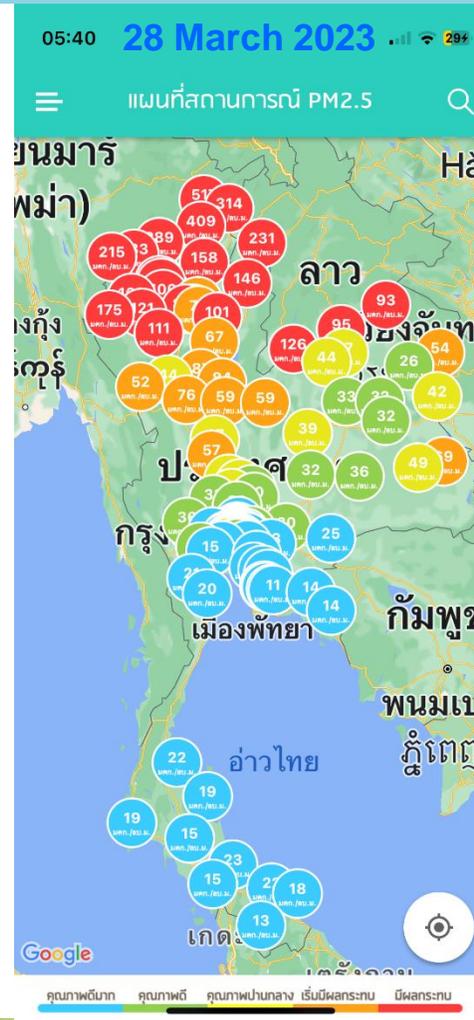
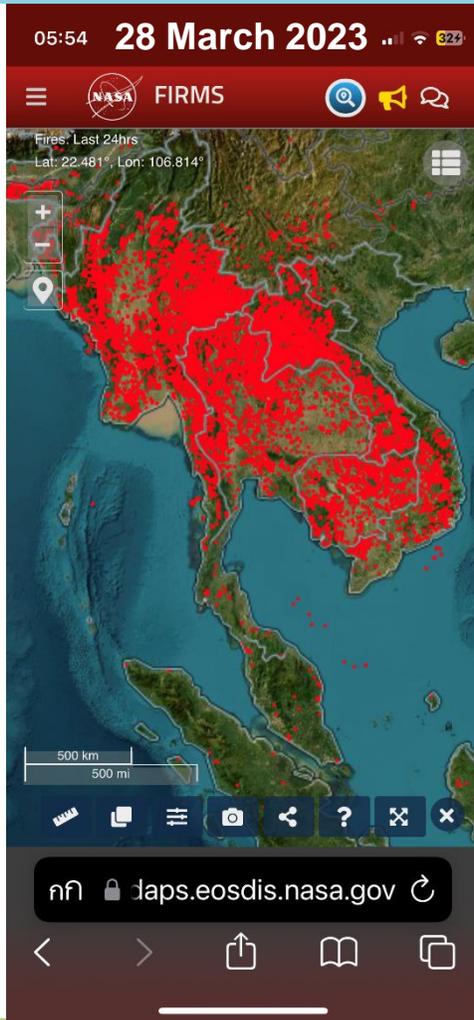


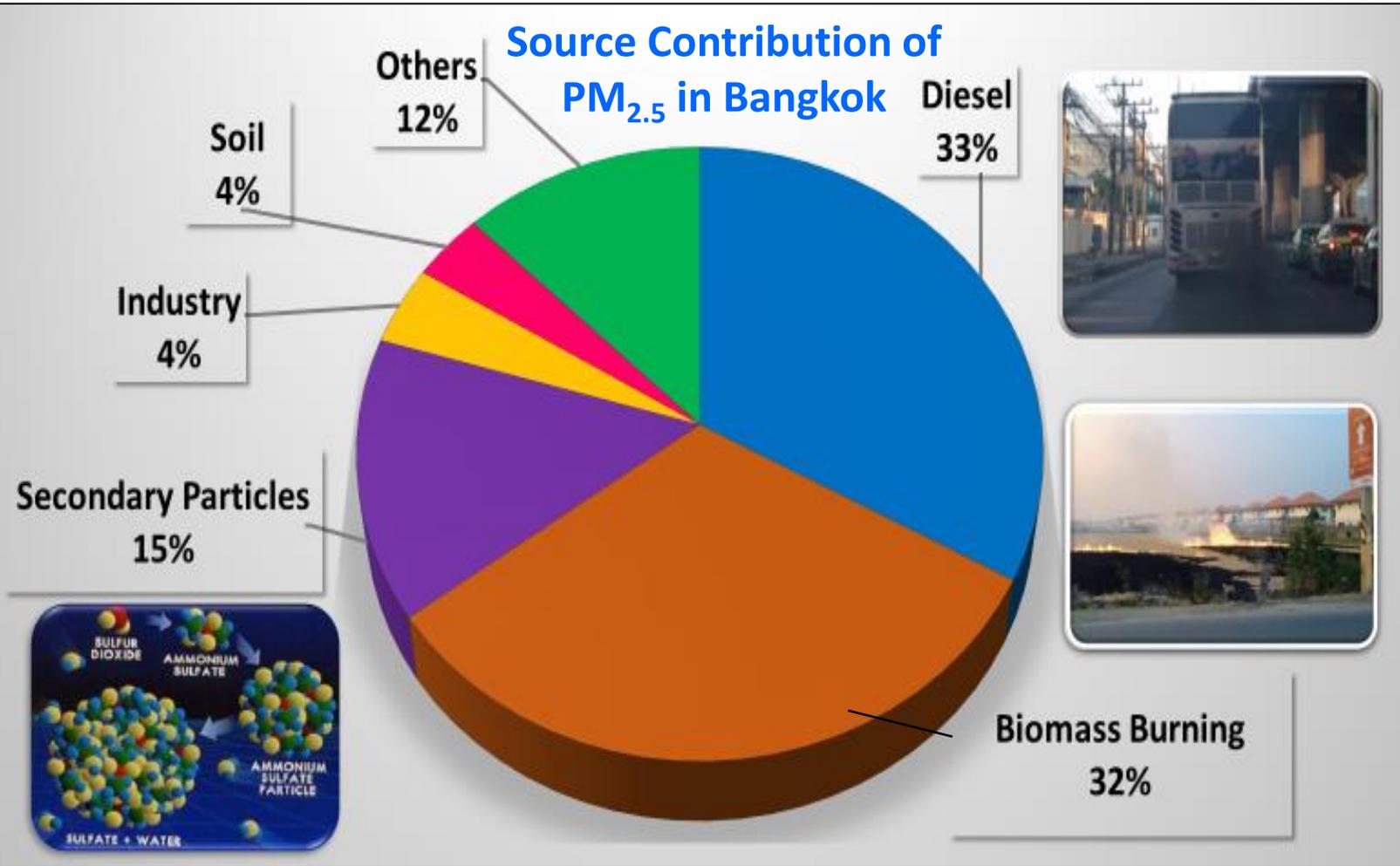
ASEAN (Mekong Sub-Region) Haze and Hotspot Map on 13 March 2019 (ASMC)



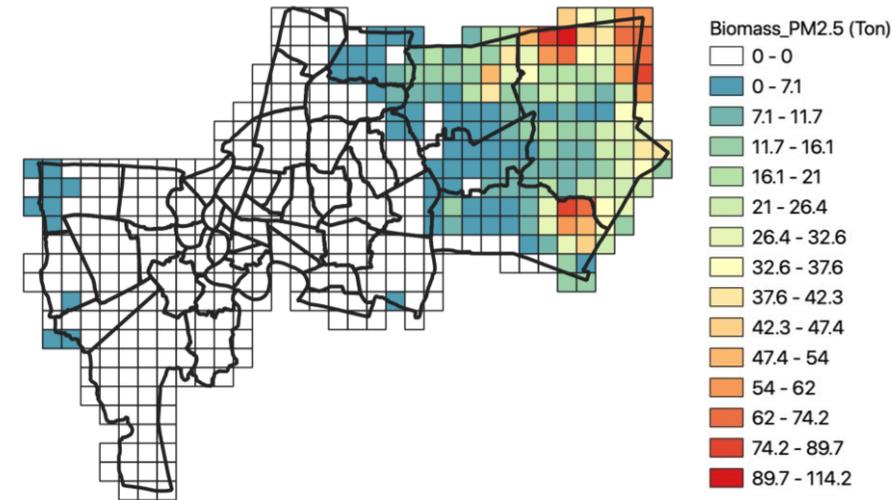
Trends of Cumulative Hotspots Number and PM_{2.5} in Northern Region

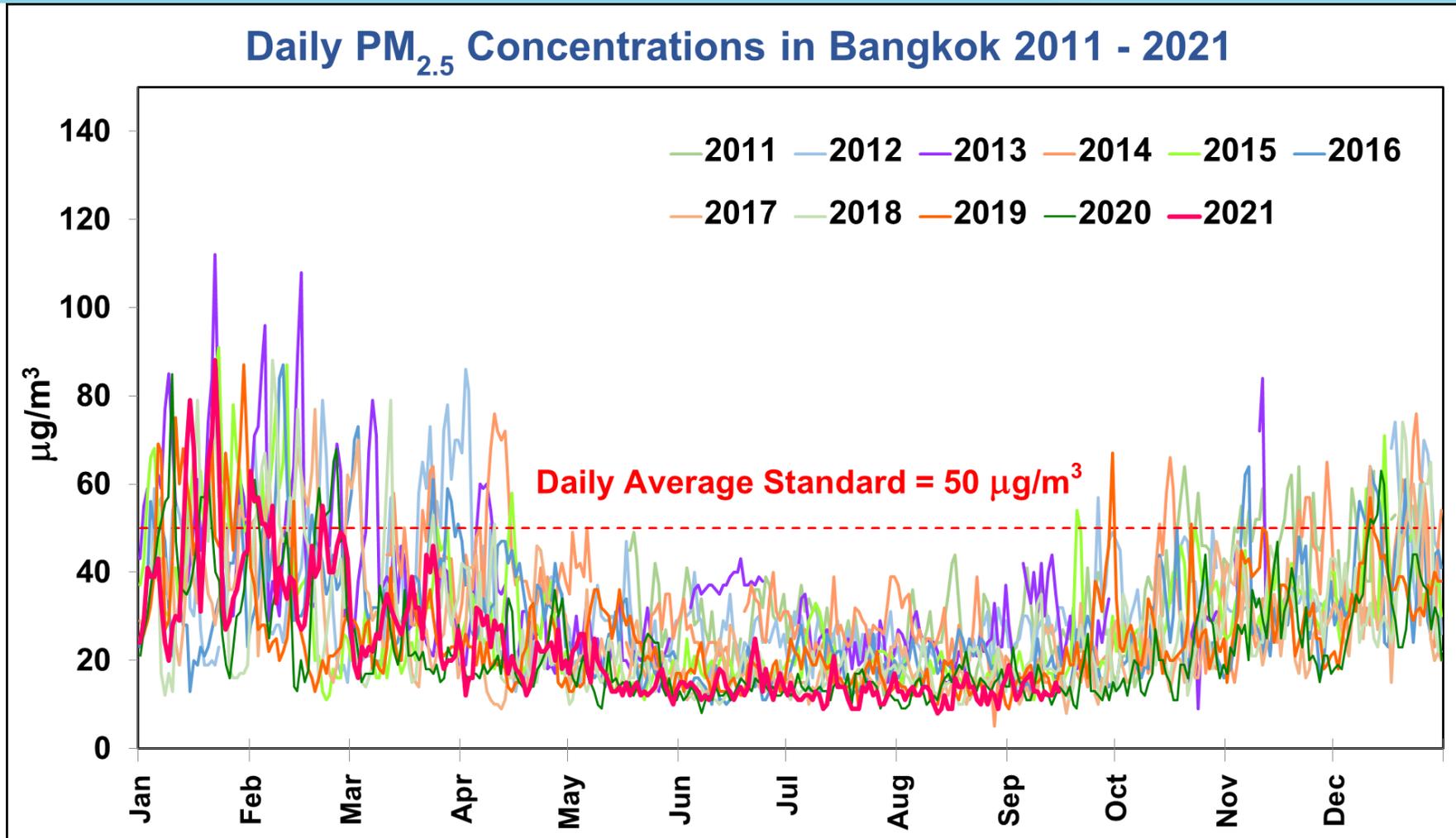






Biomass Burning in Bangkok





Why do farmers burn?

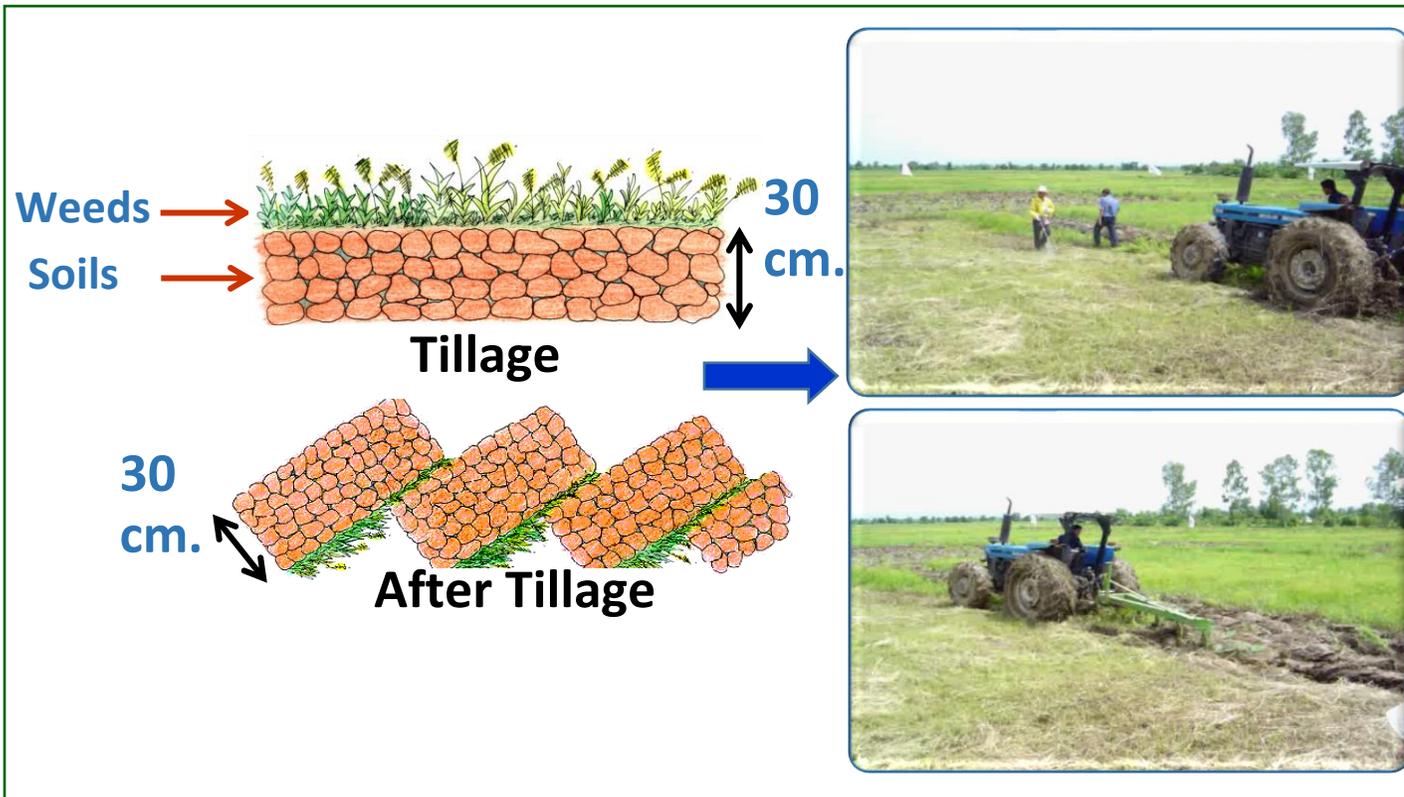
- Cost saving
- Less labour intensive
- Time saving
- Traditional attitudes, practices, and beliefs



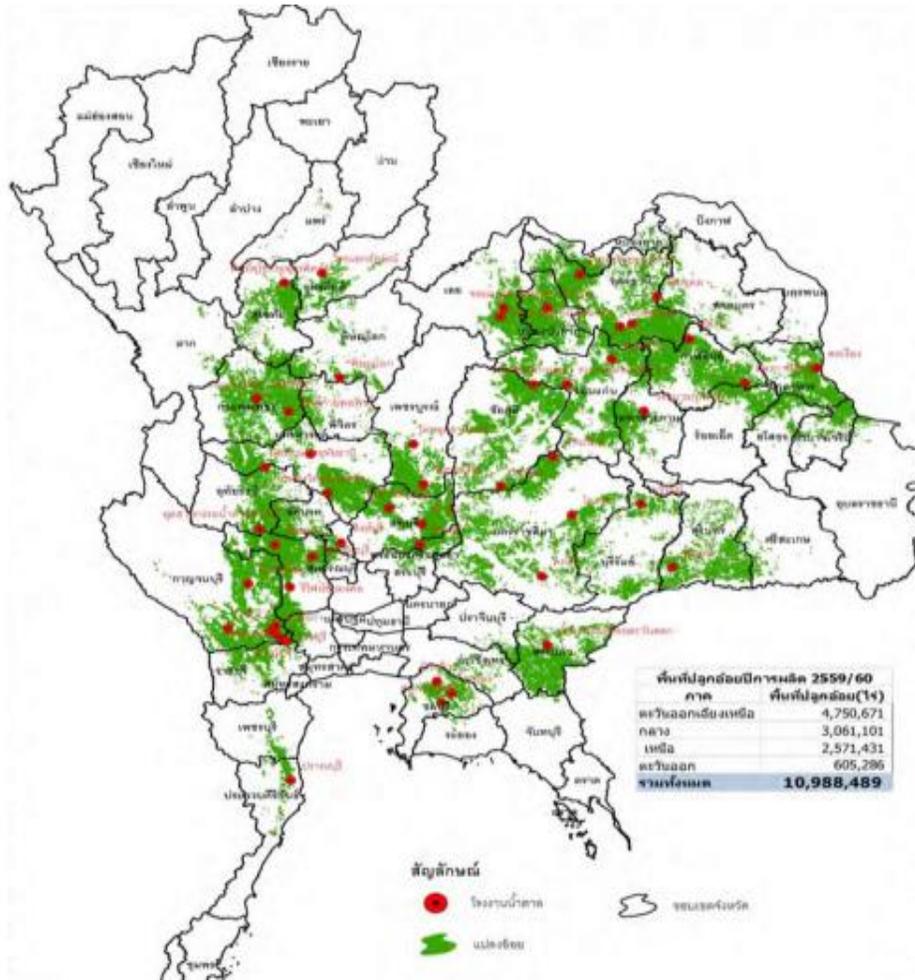
Part 2: Possible Solutions for Open Burning of Biomass in Thailand



Stubble ploughing in rice cultivation



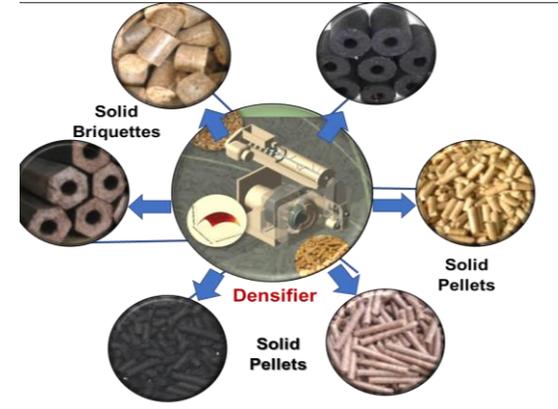
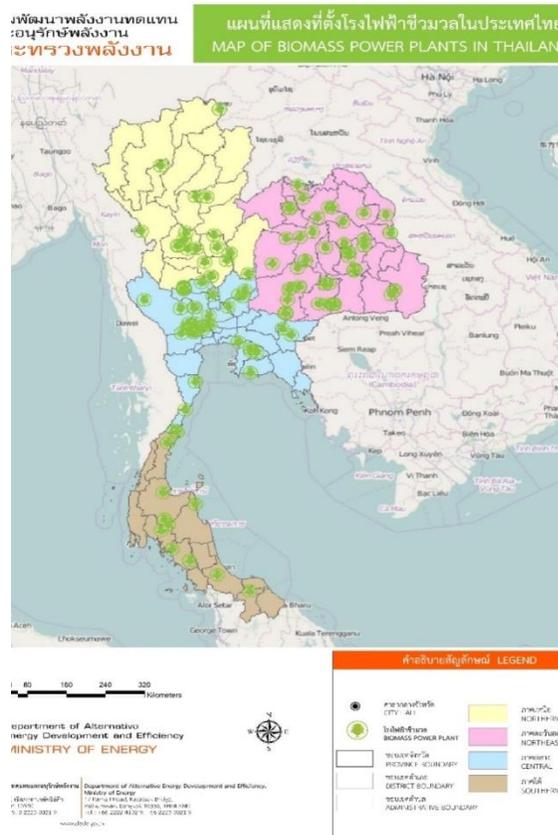
<https://youtu.be/KxA4efbOFgY>



- Differential pricing between burned and non-burned sugar cane
- Cutting machines
- Capital investment for machine
- Machine sharing center



Waste-to-Energy Policy with Feed-in-Tariff (FIT)



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Variety of Household Products made from Rice Straw



Materials for soil mulching materials



Livestock feed and bedding



Cultivation of mushrooms



Composting and compost from agricultural residues

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Examples of Good Practices in Thailand

Organic fertilizer bank

Bann Yang Tai Village,
Si Satchanalai District,
Sukhothai Province



Utilizing byproducts from maize farms for cultivation of organic mushroom

Ban San Rungrueang Community

Promotion against burning in farmlands

Mae Ku Sub-district,
Mae Sot District,
Tak Province



Promotion against burning of farming materials by Agricultural Learning Center (ALC) in Nakhon Nayok Province

Nakhon Nayok Province

Adding value to farmlands and contributing to reduction of open burning and environmental protection

Ban San Rungrueang Community
of Nan Province

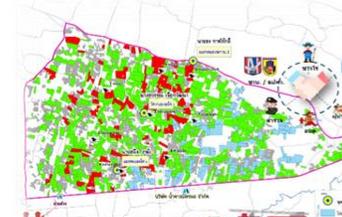


Mae Chaem Model Plus for reducing areas subjected to burning and adding more forest lands

Ban Thap Sub-district, Mae Chaem District, Chiang Mai Province

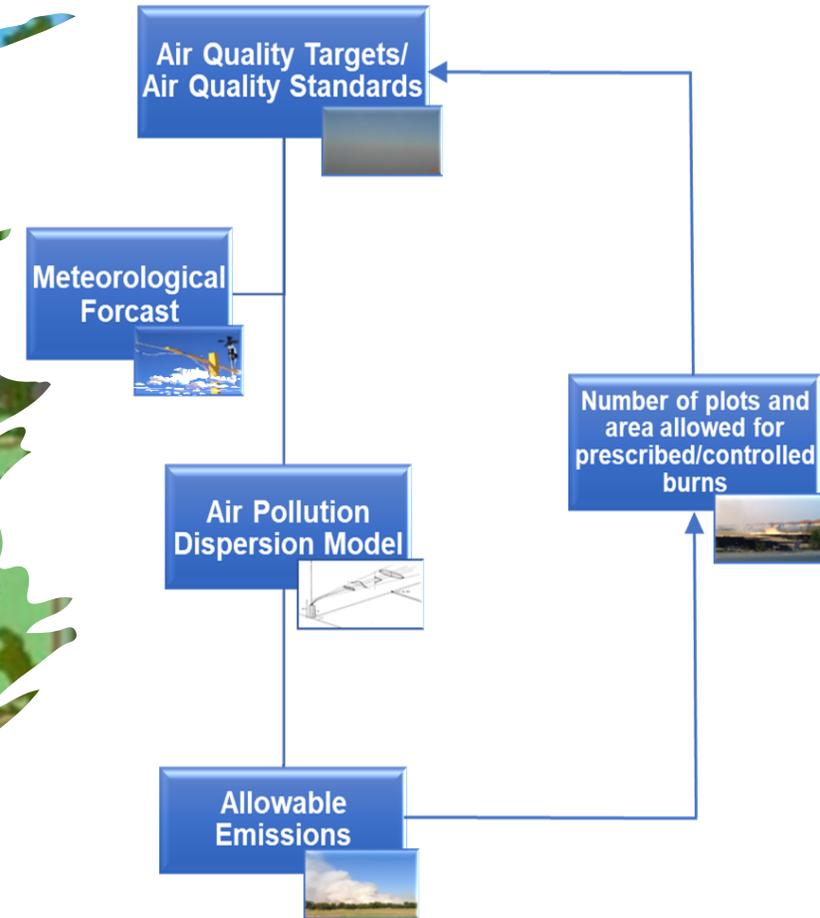
Development of compressed sugar leaves and shots tablets as fuel materials

Faculty of Engineering King Mongkut's
University of Technology North
Bangkok



Mega Farm Enterprise at Chaeng Ngam Sub-district

Nong Ya Sai District, Suphan Buri Province



Challenging Issues – Farmers still continue to burn!!!

- **Banning open burning vs control and management of open burning?**
- **Machines are expensive?**
- **Taking a long time for farmers to change attitude, behaviour and practices?**
- **Financing non-burning technologies and practices?**
- **Difficulty in collecting and transporting agriculture residues?**
- **Pollution problem from biomass power generation?**

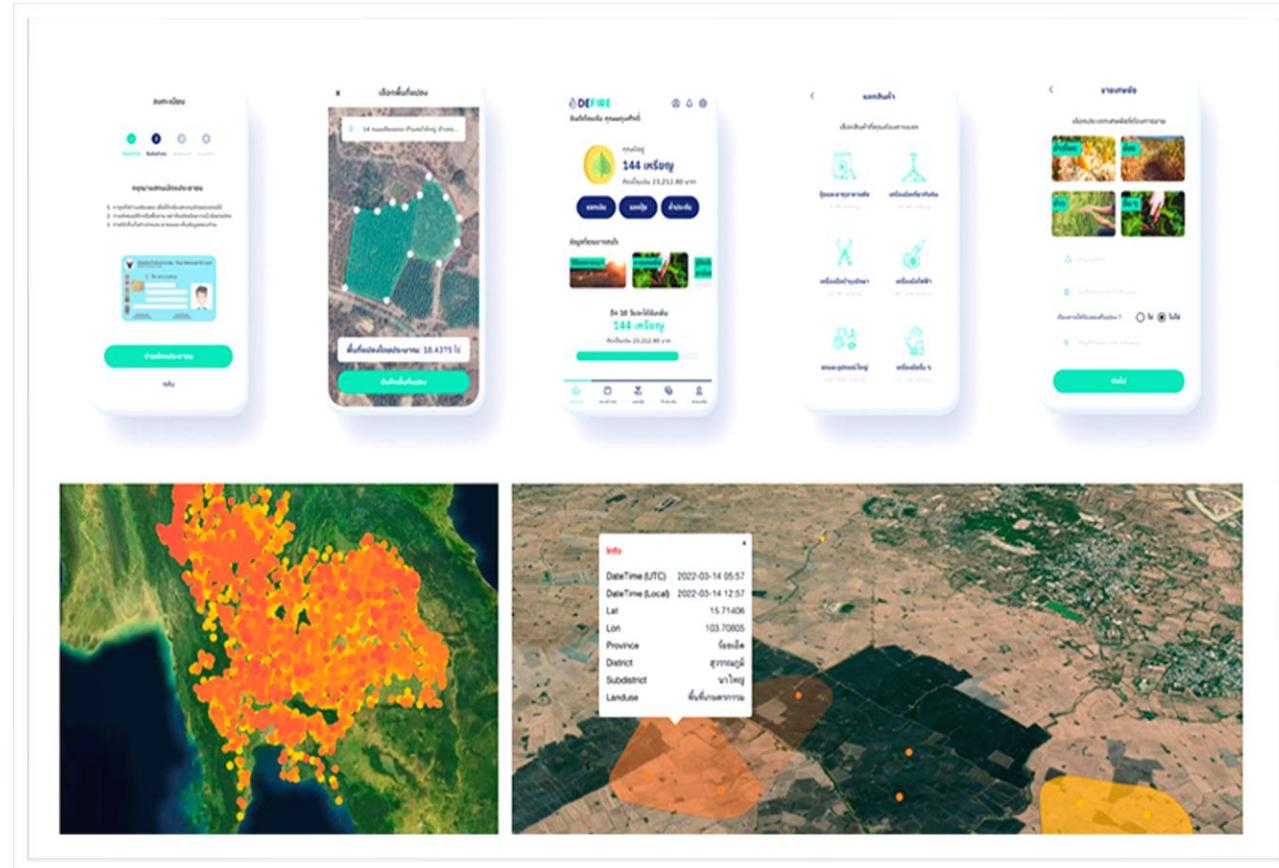
There are solutions

Defire: a Thai startup fighting crop residue burning and air pollution with green financing.

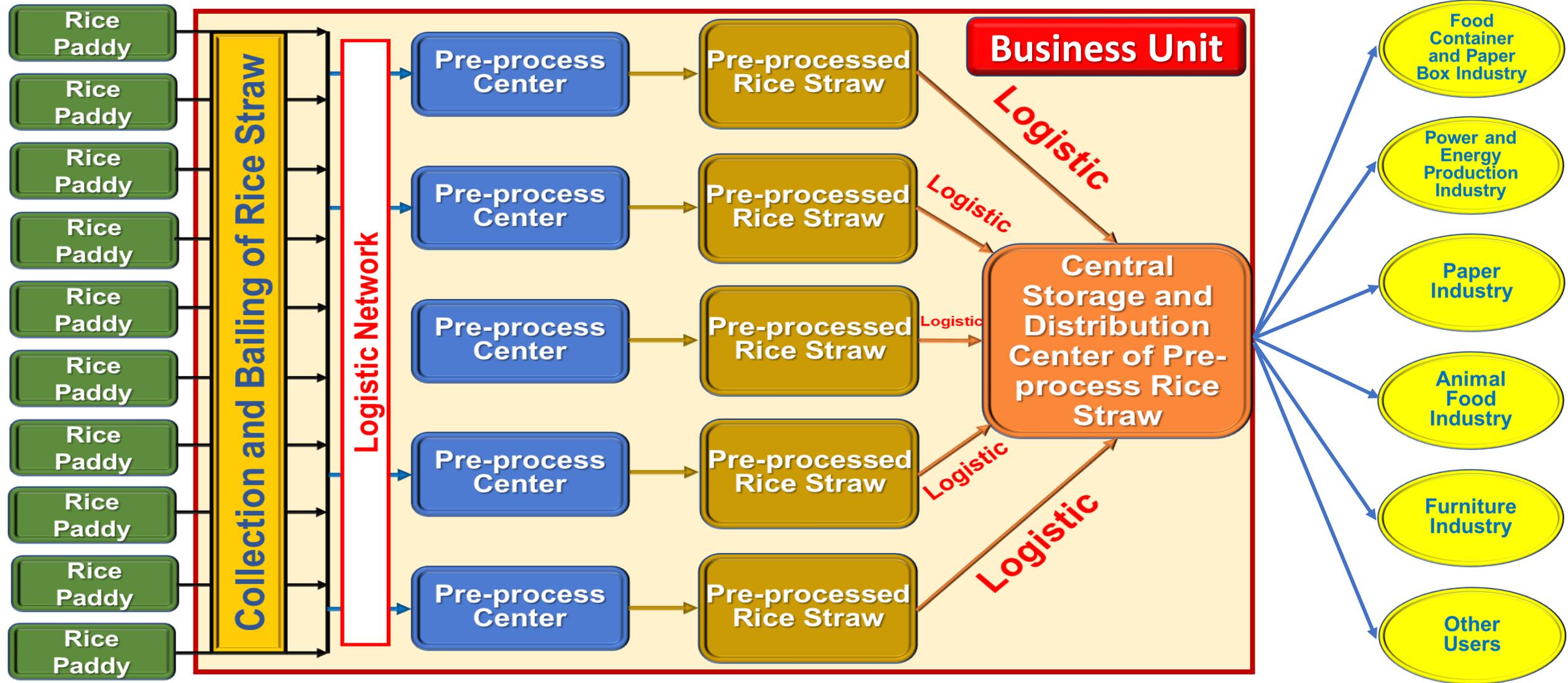


- **June 2022** — A green finance platform called ‘**Defire**’ developed by a Master’s student in Development and Sustainability Program (DS) at AIT.
- **Defire mission** is to make a meaningful impact on society and contribute to climate change by reducing crop burning issues in Thailand.
- **Defire** operates with local farmers registering to the application, providing their personal information and information about their land — which allows a satellite system to collect data to be processed by machine learning to determine if and how much carbon is emitted through agricultural burning.

- The platform will provide the carbon credit to the organization that needs carbon offset. Money from the buyer will be converted and transferred to the farmers in the form of a point (or token), operating through Blockchain technology.
- In summary, **the mission of Defire is “Stop Hunger, Stop Fire”** as portrayed in **2R and 1I** (Reduce pollution, Reduce Greenhouse Gas Emissions, and Increase farmer’s income). The platform was launched in June 2022 and can be accessed here defire.earth



Circular Economy - Value Chain Creation for the Utilization of Rice Straw



**Multiple Benefits
from Open-
burning Reduction**



Emission Reduction

- PM
- BC
- CO₂

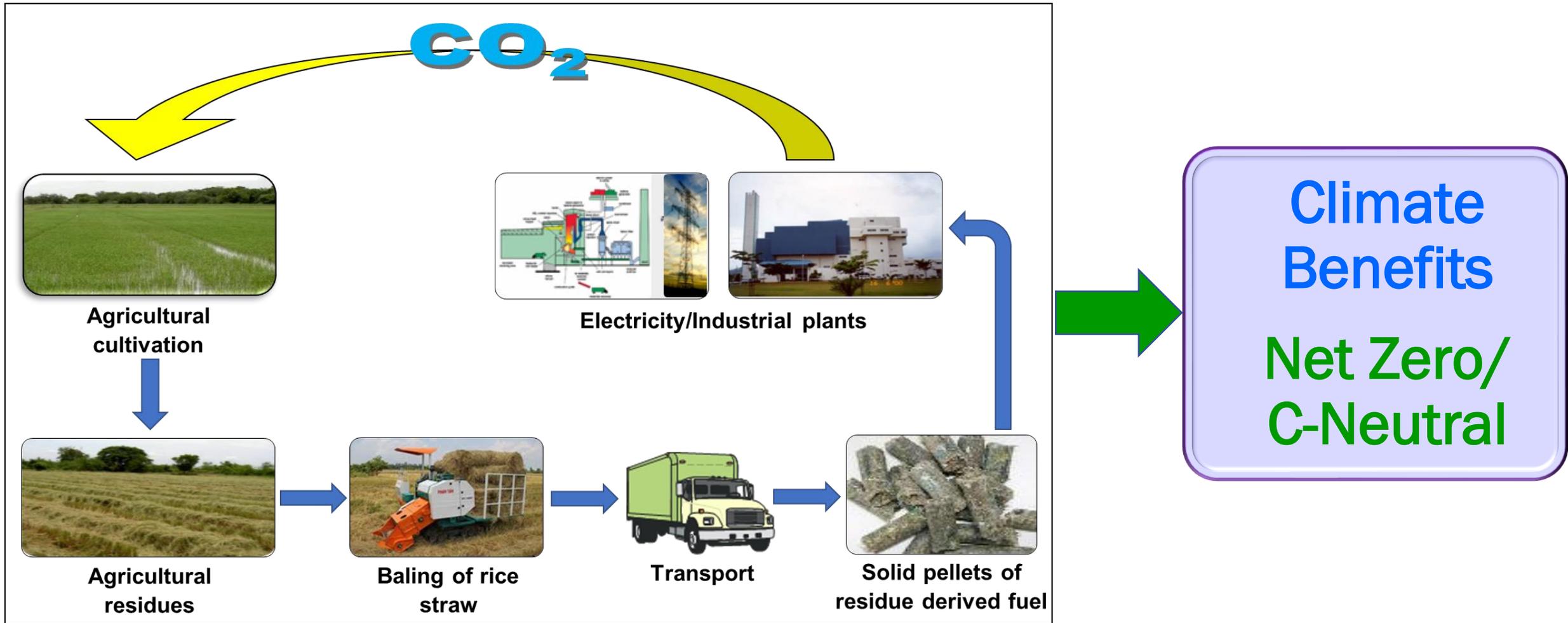
Air quality benefits

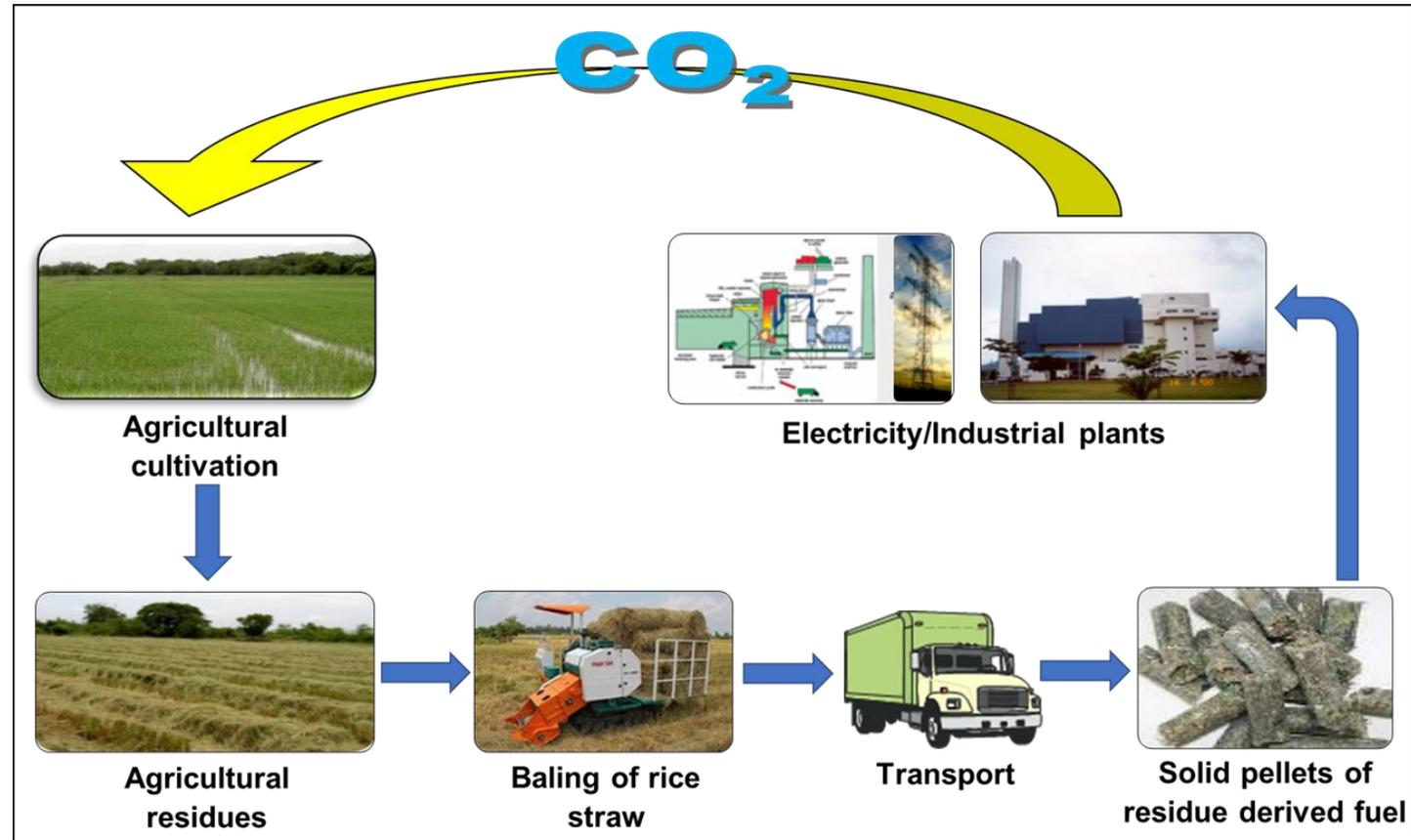
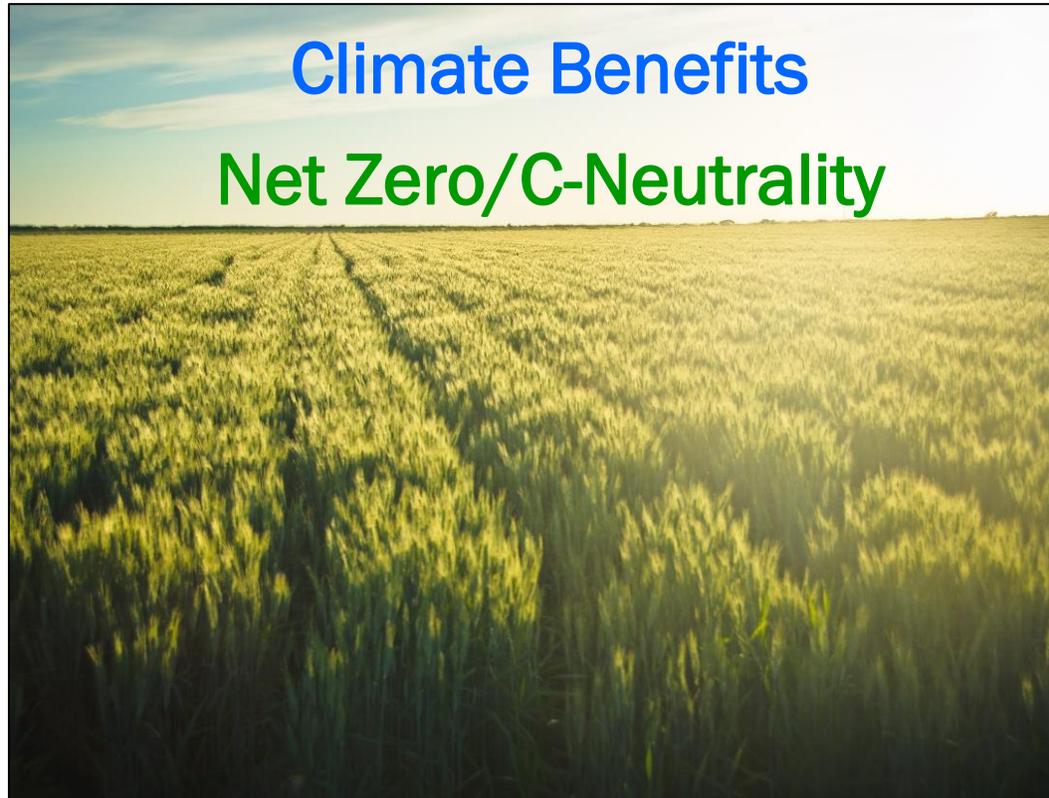
Climate benefits

Environment benefits

Health benefits

- Reducing mortality
- Reducing morbidity





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Thank you for your attention