
Connecting Climate Actions on Forestry and Energy Sectors

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Global warming will bring **more extreme weather** and **climate-related events**

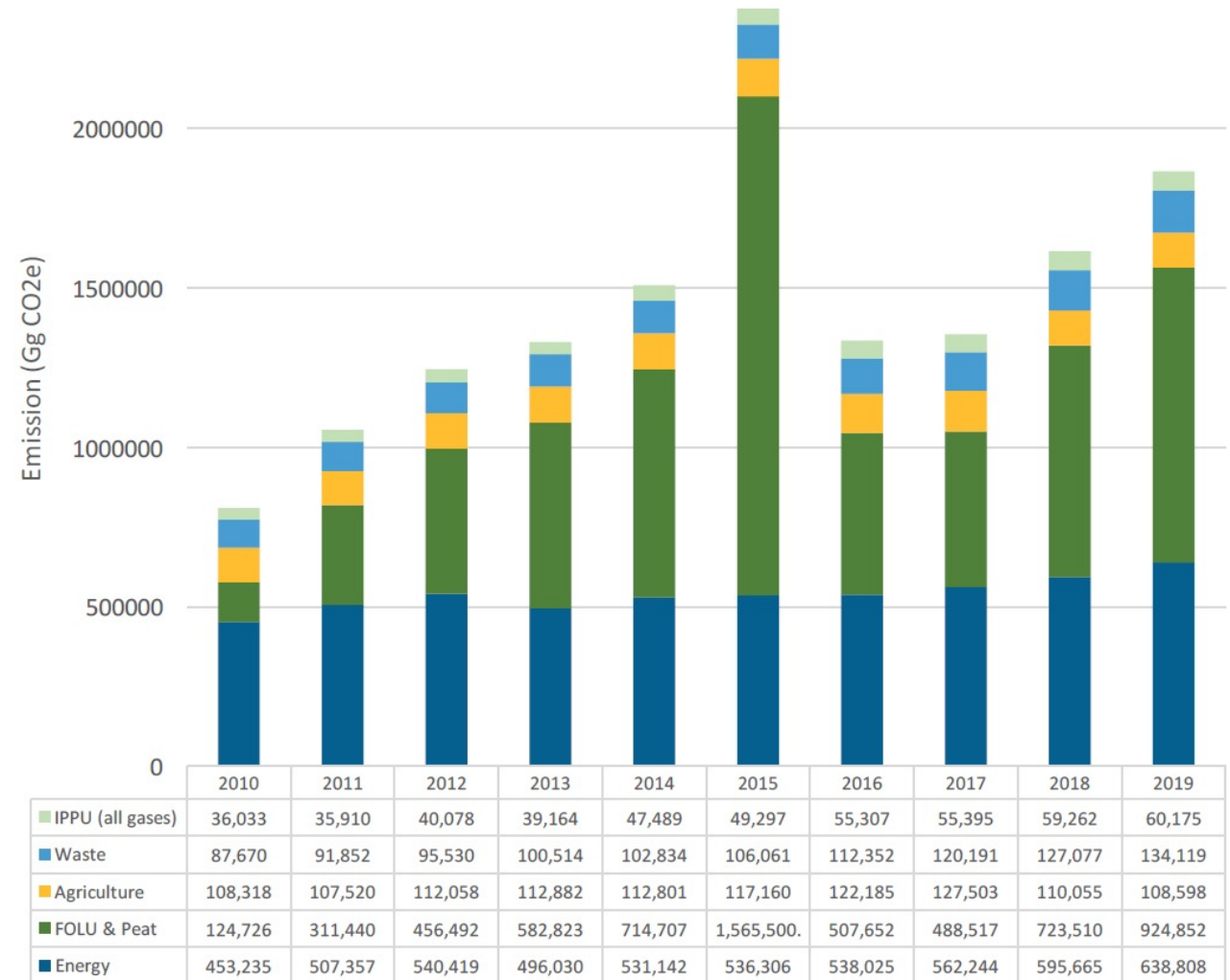
- Throughout 2020, BNPB data showed that **99% of disasters** in Indonesia were **hydrometeorological**.
- Ministry of Finance estimated that **economic losses** due to disasters reached an average of IDR **22.8 trillion per year**.
- While **the death toll** due to natural disasters in the last 10 years reached **1,183 people**.



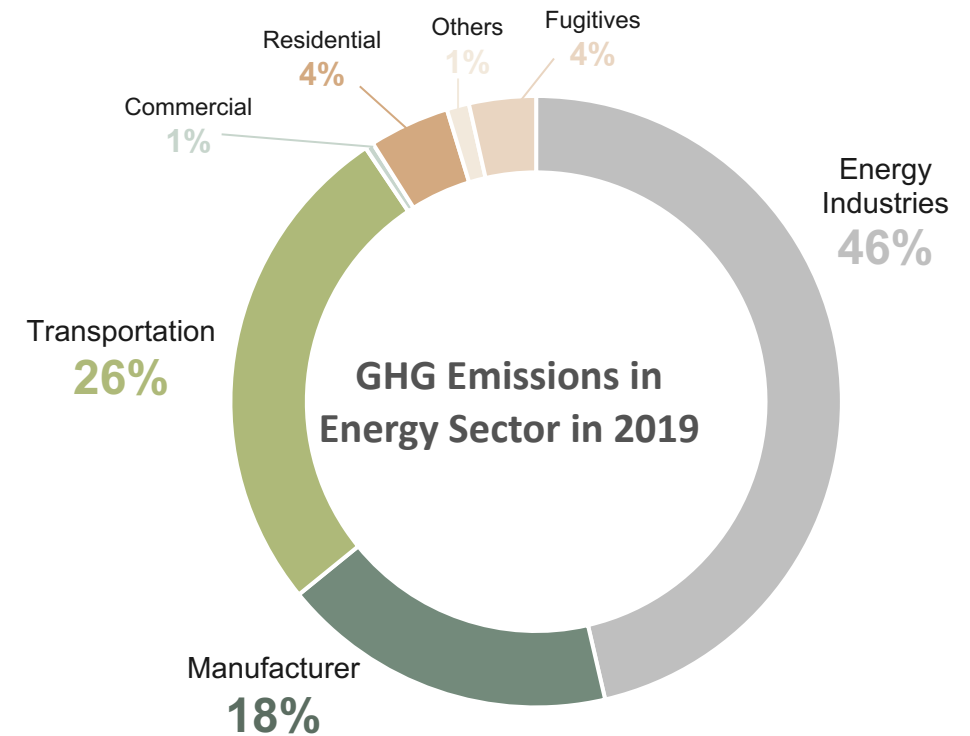
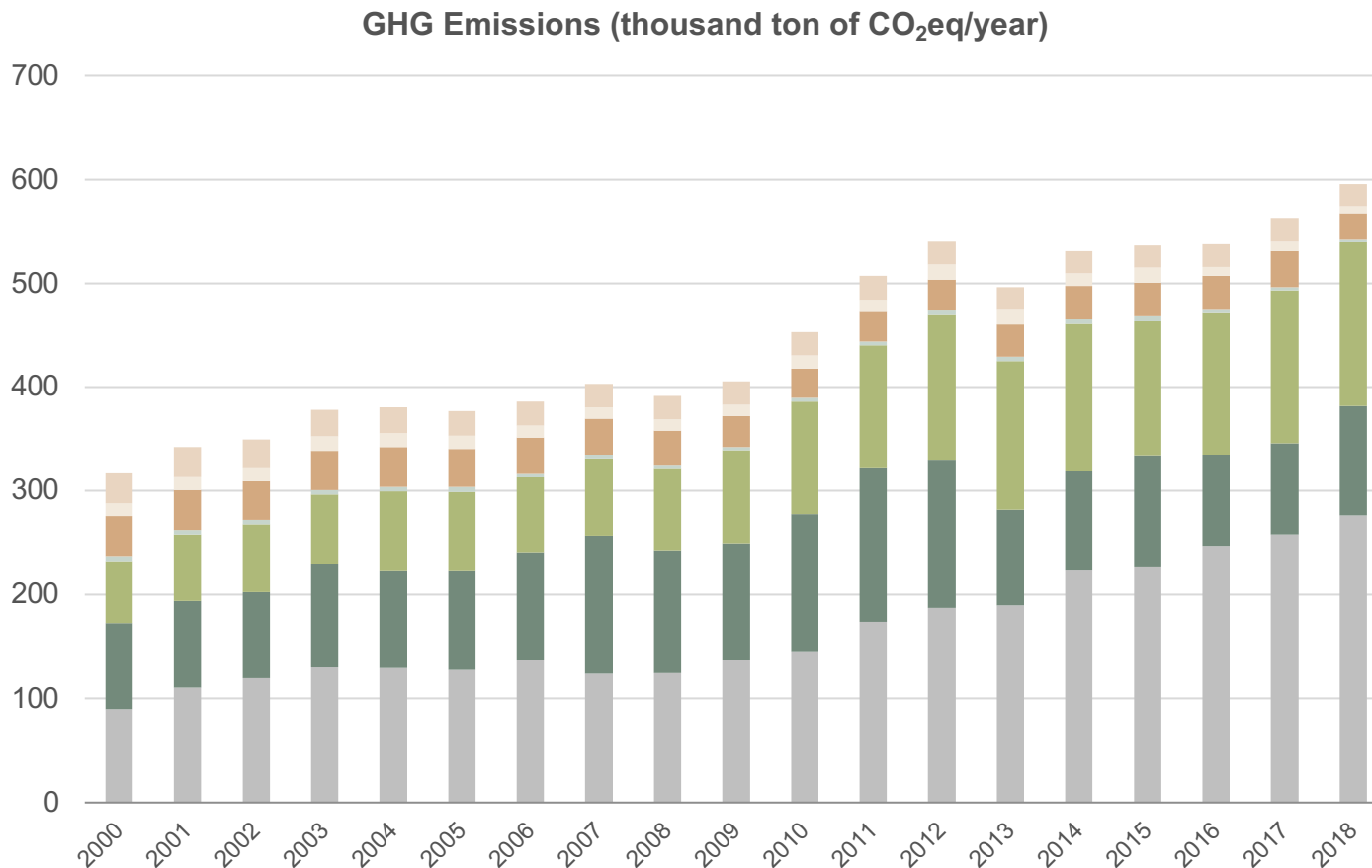
An aerial view of the aftermath of **tropical cyclone Seroja** in East Timor in April 2021 that **killed at least 165 people**. This disaster also caused **economic losses totaling of IDR 1.3 trillion**.
(photo from Aditya/Antara)

Indonesia's Greenhouse Gases (GHG) Emissions mainly come from the **Food and Land Use (FOLU) & Peat sector**

- In 2019, FOLU and Peat contributed to **50 percent** of Indonesia's GHG emissions.
- Based on Indonesia Vision 2045, there will be an additional of 7 million hectare land for agriculture until 2045.
- An increase of commodity prices this year will be a challenge to reduce GHG emissions from FOLU and Peat sectors.



GHG emissions in energy sector mainly come from **power generation**

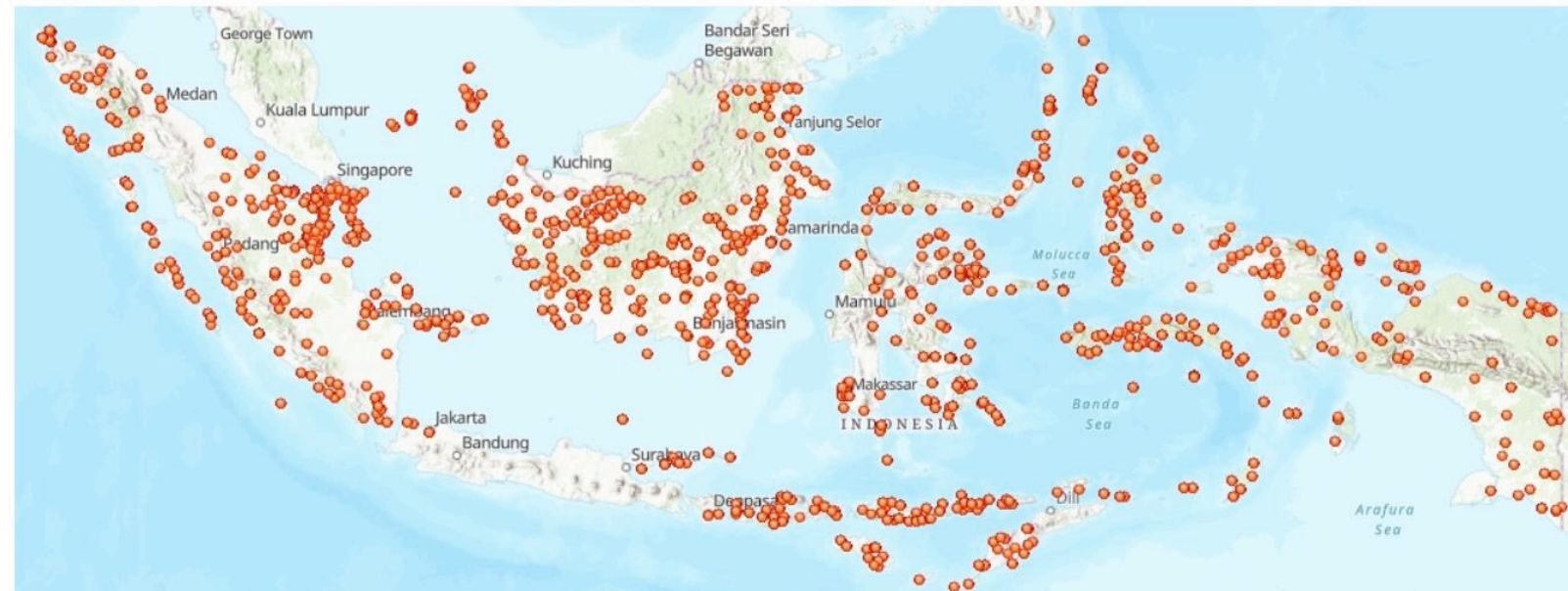


Source: Ministry of Environment and Forestry, 2020

Grid connectivity challenges

- Indonesia is **the largest archipelago** country that comprises of 17,508 islands of which **6,000 are inhabited**.
- Hence, there are many **distributed and isolated grids** that mostly rely on diesel power plant.
- In 2020, there are more than **5,200 thousands diesel power plant** with total installed capacity of **4.863 GW**.
- Reliance on diesel makes the electricity may be unavailable when there is **fuel shortages**.
- Electricity generation from diesel is also **the most expensive** and **the 2nd most polluting** after coal.

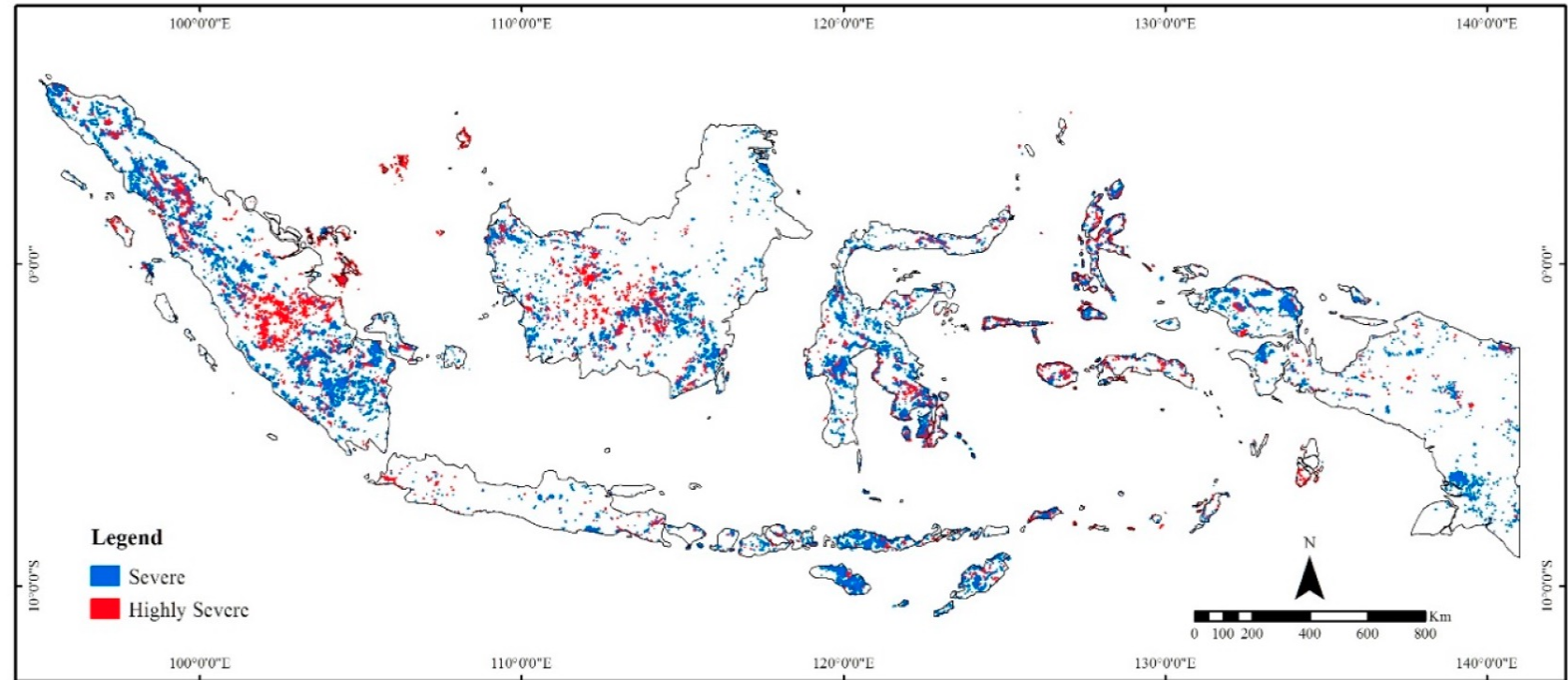
Locations of Diesel Power Plants in Indonesia



Source: PT PLN, 2021

As a tropical country, **Indonesia faced more severed land degradation** than in other parts of the world

- **5.8 million hectare** of degraded lands in Indonesia have limited ability to produce food, to store carbon, and to conserve vegetation and biodiversity.
- Land restoration is very costly, can be up to **2880 dollar per hectare** (Rahman et al., 2019).
- The very high cost of land restoration may not be a viable option for governments and local communities.



Map of degraded lands in Indonesia (Jaung et al., 2018)

A Nature-based Solution to tackle **Food-Energy-Environment Trilemma**

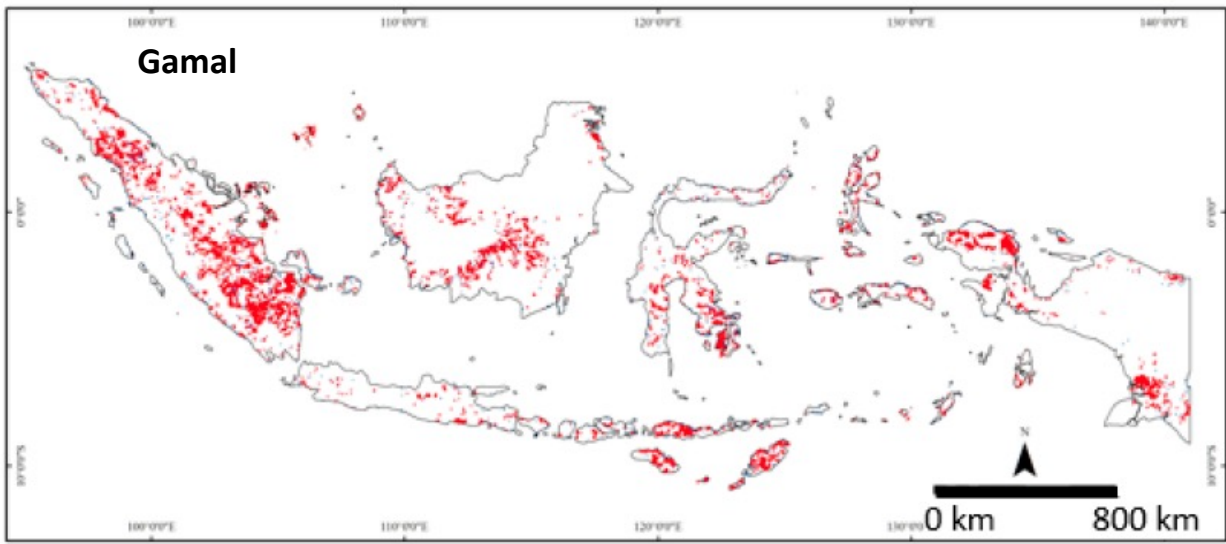
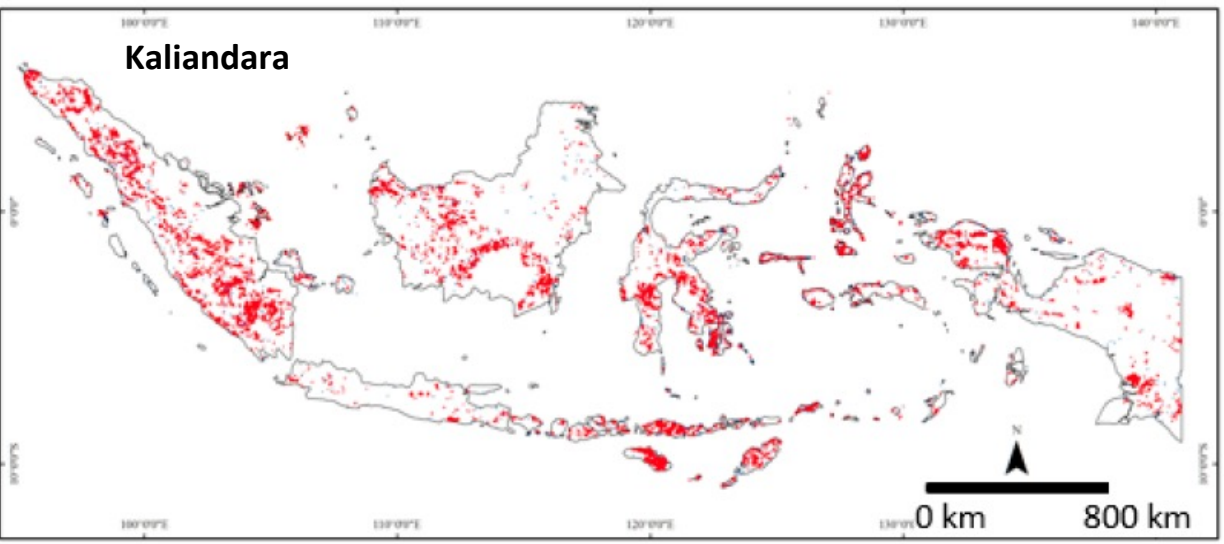
Bioenergy crops, such as Kaliandra and Gamal, could be cultivated as a restoration crops in agroforestry systems that produce bioenergy and food, while functioning as a method for low-cost land restoration and environmental conservation.



Energy Transition from Diesel to **Biomass Power Plant**

- Biomass PP brings a **cheaper and greener** solution for remote region that is still supplied by Diesel PP.
- At the same time, bioenergy crops can make soil more fertile, store more carbon in land, and benefit local communities. **2.8 and 1.6 million ha** of degraded lands are suitable to grow Kaliandra and Gamal, respectively.

Map of degraded lands in Indonesia that are suitable for cultivating Kaliandra and Gamal (Jaung et al., 2018)





Thank you



“ *The future will be green or not at all.*
- Jonathan Porritt